**OLD GLORY FLIES PROUD — Our nation's flag was raised to half-staff in front of Bldg. 800 on the first day after employees returned to work following the terrorist attacks of 9/11. Silhouetted is then-Security Police Officer Buster Dial. The *Lab News* first ran this photo in the Sept. 21, 2001, issue. (Photo by Randy Montoya)**

# 9/11 remembered

## In post-9/11 world, Labs' strategic objectives leverage diverse capabilities to serve nation

### *Labs Director Paul Hommert talks about impact of 9/11 on national security mission*

***Note:*** *The* Lab News *recently sat down with Sandia President and Labs Director Paul Hommert to talk about how the terrorist attacks of Sept. 11, 2001, and the nation's subsequent response have shaped Sandia's strategic direction over the past decade and how those attacks have framed the discussion about the just-completed 2012-2016 strategic plan.*

***Lab News:*** *In September 2001 you were working in the UK. Did you happen to be in England on 9/11 itself?*

**Paul Hommert:** Yes, I was in England. I'd been in the States and had flown back to England the Sunday before, the 9th. Like anyone, I can remember 9/11 precisely. In the UK, it was a little after lunch, in the early afternoon. I was in a meeting when one of my colleagues came in, grabbed me and said, "You have to come and see this." As I watched the events unfold, I was just staggered; I mean I actually couldn't stay at work, I had to leave because I was glued to the television. And you have such a range of emotions. One of the most telling things is the enormous outpouring of respect, the true depth of caring that came from my British colleagues. It's something I will always remember. It was genuine and immediate; it was especially meaningful because I think they understood that in a situation like this, I wanted to be home. That was hard to wrestle with, that I couldn't do anything.

Sandia President and Labs Director Paul Hommert

*(Continued on page 7)*

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Sandia National Laboratories

## Becoming a national security lab

### *9/11 terrorist attacks hastened a trend that began with end of Cold War*

By Bill Murphy

Almost everyone older than 18 remembers where they were on Sept. 11, 2001. That day has joined other days of infamy — Pearl Harbor, the day President Kennedy was assassinated — in the collective consciousness of the nation. If you were around at the turn of the millennium you can recall, often in very specific detail, not just where you were, but what you were doing and who you were with when you heard that terrorists had attacked the World Trade Center in New York and the Pentagon near Washington, D.C.

The very date — 9/11 — has entered the language, with no other explanation needed. And when you hear it — 9/11 — the words summon up not just images, but

*(Continued on page 9)*

**The lab the nation turned to . . .**

*• See page 2 for complete table of contents •*

## That's that

A few months back — actually right after the ninth anniversary of the 9/11 terror attacks on the US by Al Qaeda suicide killers — several of us here at the *Lab News* began to talk about doing something special marking the 10th anniversary of that horrible, consequential day and its impact on the Labs. As we drew closer to the time when we'd have to start divvying up assignments and begin pulling content together, it became clear that our original vision — that we'd do a so-called double-truck spread in the center of our Sept. 9, 2011, issue — would be inadequate to tell the story of 9/11 from the Sandia perspective.

And now, as I look at the stories and other content we've created for this issue, I believe it's really something special. Just from a purely logistical perspective, we haven't in my nearly 17 years of association with the *Lab News* tried to put together an issue of this scale as part of our regular biweekly production schedule. To make that happen, every single member of our team had to pull extra duty, cheerfully taking on tasks outside their normal sphere of activity.

I didn't know what to expect when we started down this road, but it has exceeded both my hopes and my expectations. Anyone reading this novella-length look at the Labs' first decade of the 21st century gets not only a sense of 9/11's impact on Sandia and Sandians, they also get a pretty darned good sense of where we are right now, today, as a laboratory.

In this issue, the three laboratory directors of the post-9/11 era — Paul Robinson, Tom Hunter, and Paul Hommert — share their perspectives and insights about the state of the world and Sandia's place in it. A number of our VPs weigh in, too, with their own ideas about how 9/11 has shaped the Laboratories and the challenges that may lie ahead for us as we continue to serve the nation. You'll find, too, a fascinating, even gripping, account of those first fateful days after America was attacked and how Sandians responded to the nation's call. California has had a unique role in the Labs' post-9/11 era, a role you'll learn more about here, thanks to a panel discussion featuring former site VP Mim John, current VP Rick Stulen, and others. And let me especially call your attention to the Q&A on page 14 with Jill Hruby who leads our International, Homeland, and Nuclear Security Strategic Management Unit. I found her discussion about the challenges of working with new customers, including the still relatively new Department of Homeland Security, to be particularly insightful. I'm just touching the tip of the iceberg here: I encourage you to find the time to read through the entire issue. I promise you'll come away with a more expansive sense of both who we are and what we can be.

* * *

The theme of this issue is: "How did 9/11 change the Labs?" But the real question people will have, I think, is, "Are we making a difference?" The short answer is oh yes; the more complicated answer is that there are some areas of the Labs' post-9/11 engagement we just can't discuss. Executive VP Jerry McDowell puts it in perspective: "Many of our greatest contributions remain cloaked in secrecy, but you may rest assured that Sandia has made significant contributions to our nation."

* * *

I was driving home from work not long ago when I heard something on a local radio program that just thrilled me, so much so that I had to tell my wife about it right away. What was it? A simple reference to an ongoing national soccer tournament in which an Albuquerque team was doing very well. The team was called Albuquerque United 93. "This is marvelous," I said. "Teams are finally naming themselves for real American heroes!" No more bears, lions, cubs, and falcons . . . not that there's anything wrong with those. But naming yourself after the heroes of United 93, the first Americans to stand up and fight Al Qaeda — why that's wonderful. I went online to find out more about this great team with the inspired name, only to discover that the team is actually part of the Albuquerque United club soccer program, and the 93 refers not to a flight number but to the year the team members were born. There were "93" teams all over the country. Talk about being deflated . . . but the whole misunderstanding made me think: Why *shouldn't* we have teams named after our new heroes: the Beamers, the Rollers, the SEALS, and yes, the United 93?

See you next time.

*— Bill Murphy (505-845-0845, MS0165, wtmurph@sandia.gov)*

# 9/11 remembered

## *The* Lab News *looks at how the post-9/11 era has affected Sandia and the people who work here*

### *Inside . . .*

"I don't know how not to be optimistic about us moving forward, Between our mission, our talent, and unfortunately, the diversity of the nation's challenges, Sandia is an important and great place to be."

* * *

Sandia President and Labs Director Paul Hommert on how 9/11 has helped shaped Sandia's strategic direction. . . . . **See page 1**

"Looking back on those awful events, some memories are very intense, while others are fading. Let me try to give you a flavor of how our work intensified in the immediate days and weeks . . ."

* * *

Reflections by former Sandia President and Labs Director C. Paul Robinson.

. . . . . **See page 4**

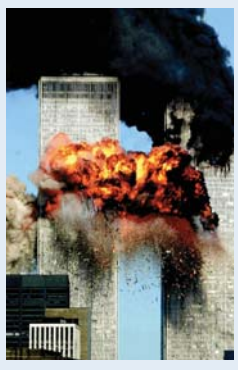
"Basically, our role is to deter them and outsmart them and to ensure that there is never a technological surprise we're not ready to respond to."

* * *

Former Sandia President and Labs Director Tom Hunter talks about the lessons of 9/11.

. . . . . **See page 5**

### The laboratory the nation turned to . . .



An hour-and-a-half after the first plane hit, Paul Robinson recalls, NNSA Administrator Gen. John Gordon called to ask for Sandia's help, saying, "'Get some guys back here to help me handle all the requests we're getting, and the communications with all the other labs and sites.'"

See **pages 10-11** to read about Sandia's response to the nation's call in the first frantic days after 9/11.

### *Also inside . . .*

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# Division 8000 leadership cites changes in homeland security mission since 9/11

## *New constituencies, expanding chemical/biological and radiation/nuclear countermeasures activities are noted*

Lab News *reporters Mike Janes and Patti Koning interviewed Div. 8000 VP Rick Stulen and Senior Manager Duane Lindner, as well as retirees Mim John and Carolyn Pura, about the impact of 9/11 on Sandia's homeland security mission. Among many roles during his 35-year Sandia career, Rick served as VP of the Labs' homeland security and defense organization. As he was in 2001, Duane is program director for chem/bio national security programs at Sandia, while Carolyn played an integral role in rad/nuc countermeasures activities during her time at Sandia. Mim served as the Div. 8000 VP from 1999-2006 and led the stand-up of the Labs' Homeland Security Strategic Management Unit (SMU) in 2003.*

* * *

***LN:*** *Though it may not have been called "homeland security" at the time, how would you characterize the Sandia programs — especially those in chem/bio and rad/nuc countermeasures — that existed at the Labs pre-9/11?*

**Duane Lindner:** In 1996, DOE took the lead in standing up a program aimed at civilian chemical and biological defense. Sandia began to get heavily involved, specifically in developing decontamination technologies, an effort led by Mark Tucker (6632), and systems that could detect the release of chemicals and, subsequently, biological agents in places like subways and transportation hubs.

**Rick Stulen:** In the mid- to late-1990s, I remember that Mim was the one who began to raise this issue of the asymmetric threat and, with Al Romig's support, was able to get enough LDRD funding to have some competency developed. We had some large LDRD investments like MicroChemLab, beginning in the mid-1990s.

***LN:*** *Why did we make these decisions to get into bio? Was it due to the Aum Shinrikyo subway attack in Japan in 1995?*

**Rick Stulen:** That clearly played a role.

**Duane Lindner:** It had an immediate impact at the national level. One of the large DOE projects, which we co-led with Argonne National Laboratory, was PROTECT [Program for Response Options and Technology Enhancements for Chemical/biological Terrorism]. The objective of PROTECT was to develop a system to reduce the impact of an Aum Shinrikyo-like attack on a US subway system.

***LN:*** *How did our rad/nuc capability come about?*

**Carolyn Pura:** In addition to the work for DOE in the mid-1990s, there was already a pretty healthy radiation detection program, meaning the detection of smuggled materials as well as weapons. There were deployments at Dulles airport and a number of military bases, and studies to look at what assets fit best — detection technologies, detection architectures, and so on. In late 2000, we completed the Haystack study that looked at the smuggling of nuclear assets into major urban areas. We also had a 6-month effort during the first half of 2001 that essentially was the beginning of WMD-DAC — the Weapons of Mass Destruction Decision Analysis Center.

**Duane Lindner:** There was a large, DOE-funded study called the Defense of Cities to lay out an architecture for bio-detection and response systems in US cities. Todd West (8114) led that effort for Sandia. Our pre-9/11 capabilities, in both chem/bio and rad/nuc, were in developing expertise in systems analysis and really understanding systems architectures. Pat Falcone (now on assignment at the Office of Science and Technology Policy) was a key player in establishing Sandia's system analysis expertise in this arena.

**Rick Stulen:** There was a real sense — and has been for a long time — of the Laboratory's systems engineering competencies. It is really trying to stand back and look at the totality of the problem, and that's been very much a part of our capabilities set. We were beginning to apply that competency to the emerging WMD threat.


DIV. 8000 VP RICK STULEN, right, is joined by Carolyn Pura and Duane Lindner to talk about changes in Sandia's homeland security mission since the terrorist attacks of Sept. 11, 2001. Former California site VP Mim John joined in the discussion via telephone. (Photo by Dino Vournas)

***LN:*** *Moving to 9/11 — How did that event expedite our homeland security activities?*

**Rick Stulen:** Immediately after 9/11 there was a lot of significant activity in examining aircraft impacts into all kinds

*(Continued on page 13)*

**Sandia CaliforniaNews**

# A day unlike any other

## *California site personnel rose to the occasion in wake of 9/11 attacks*

By Patti Koning

Sept. 11, 2001, was the first and only time that the Emergency Operations Center (EOC) has been activated for a real emergency at Sandia/California. With then-Div. 8000 VP Mim John across the country at an Army meeting in Boston, Pat Smith (now Acting Div. 9000 VP) and Rick Stulen (now Div. 8000 VP) were the directors charged with running the Emergency Operations Center (EOC) that day.

RICK STULEN

"When I arrived at work that morning, people here had already picked up on the news that something terrible had happened. Once we started to understand the magnitude of the attacks, the call was quickly sent out to stand up the EOC," Pat says. "The monitors in the EOC showed us what was happening in real-time."

As the emergency response director, Pat declared the EOC activated at 8:27 a.m. About 15 minutes later, she received official notice from NNSA to release nonessential personnel. At 9:30 a.m., Pat ordered a site evacuation, which was declared complete at 10:20 a.m.

"The evacuation went very smoothly, according to plan," recalls Pat. "We coordinated with Lawrence Livermore National Laboratory (LLNL) and the city of Livermore in getting such a large number of people off-site."

The EOC remained open until about 7 p.m. Pat and Rick spent most of the day monitoring the news and touching base with Sandia/New Mexico, LLNL, and NNSA. "By that time we were as confident as you could be that it was ok to leave the EOC in standby mode. We also determined that we could continue operations the next day," Pat says.

The next day, Sept. 12, Pat and Rick hosted a meeting with managers to review what had happened the previous day and why. More than a few managers were upset at having been forced to evacuate.

"There was a sense of wanting to do something, to respond to what had happened. People felt they had been deprived of that opportunity," adds Rick. "But you have to remember how uncertain things were that day. We didn't know how, when, or if the other shoe would drop. A series of events began to unfold with the first plane crash and we didn't know where the end point would be."

The biggest impact to the California site was operationally. "Within a month we were talking to Lawrence Livermore about access control on East Avenue. This was something the Labs had talked about on and off for nearly 20 years without ever figuring out what we wanted to do and how," Pat says. "9/11 leveled the playing field and brought us together."

PAT SMITH

East Avenue, which runs between Sandia/California and LLNL, had always been open to through traffic. The LLNL East cafeteria and swimming pool were open to lab families (both have since closed). With neighbors east of the labs relying on East Avenue for direct access into Livermore, restricting access to the street was no simple task. In addition, East Avenue was controlled by Alameda County, not the city of Livermore, through an easement.

"The cooperation of the neighbors, city, and county was extraordinary. Things happened quickly and at minimal cost," recalls Pat. "Everyone felt that helping the security of the labs would help the security of the community." East Avenue was closed in August 2003.

While Sandia's mission has always been closely aligned with LLNL, operationally the closure of East Avenue represented a significant change. "This was a major event and gave us a sense of how we could work together and for a mutually desired outcome," Pat says. "It laid the groundwork for future joint operations."

Vulnerabilities were viewed in a different light. The idea of a truck bomb detonating on East Avenue suddenly seemed much more real.

"We had never thought of ourselves as physically at risk," Rick says. "This was a whole new threat space, both to our physical safety and our overall mission. We were always looking external to the US and now the threat was in our backyard. People really rose to the occasion. There was a renewed sense of pride in working for a national lab."

# ‘A call I’ll never forget’

## *Reflections on Sept. 11, 2001*

***By C. Paul Robinson, president emeritus***

Having once written an article for the *Lab News* in the wake of the 9/11 attacks, I immediately agreed to *Lab News* Editor Bill Murphy’s request to write a similar piece for the 10th anniversary. He asked me to relate “what it felt like in those long work days in the immediate aftermath of the terrorist attacks,” and to “assess from today’s vantage point what changes those events might have made in the Labs” (and in our sister labs).

As I look back on those awful events, some memories are very intense, while others are fading. Let me try to give you a flavor of how our work intensified in the immediate days and weeks, and then share what I believe were some important lessons we learned about ourselves, with relevance for Sandia’s future.

The first thought that permeated all of our minds that day was that “we are at war.”

We expected that the attacks of that morning were just the first, and we would face many more until we could counter the threat, protect ourselves against it, or eliminate the source of such attacks. The work of the entire Laboratories began to take on a new urgency, and we soon ramped up our efforts in many areas to a fevered pitch as we immersed ourselves in countering new threats, all the while paying attention to our continuing missions.

I am handicapped from being able to share with you everything that was done, as a new classification sensitivity instantly arose, requiring that we protect information about our capabilities against such terrorist threats, and, in particular, not reveal publicly any major vulnerabilities we might uncover in critical infrastructures.

Without waiting for new classification guides, we already had an innate trait within our culture to keep tight lips in what we were thinking about and working on. The traffic on classified phones ramped up immediately from our traditional customers and from many others across the government.

### Aware of Sandia’s counterterrorism work

Of these calls, one that I will never forget, came within the first hour after the attacks, from Four Star Gen. John Gordon. I had known John from his Air Force years, his service on the National Security Council (while I was a US ambassador), and in his service as deputy director of Central Intelligence. We had frequently discussed a variety of important issues.

We had welcomed John with open arms as he had taken on the leadership of the NNSA, just created by Congress to take custody of DOE’s national security labs, which included Sandia. John was well aware of the counterterrorism work that Sandia had initiated at least three or four years earlier, and the conclusion we had reached in our strategic planning that “the burgeoning growth of terrorist attacks around the world” would very likely come to our own shores.

The first topic that morning focused on an issue they had already identified in Washington, D.C., which required a unique expertise that Sandia possessed, on a subject that had been truly arcane until that morning — the collision of fully fueled large jet aircraft into structures.

All of you, I am sure, are aware of some continuing projects, which Sandia was first asked to take on in the mid-1980s, when military F-4 Phantom jets were being introduced into service at allied bases around the world. It had been noted that some of the bases were located near operating nuclear power stations, so the question arose: What would happen if one of these planes were to crash into a nuclear power plant? A Japanese design firm requested help from the US to build a good calculational model for such an event.

FORMER LABS DIRECTOR Paul Robinson, with chin in hand, hosts a delegation in 2002 that included NNSA Administrator John Gordon, behind Paul, then-US Rep. Heather Wilson, then-DHS Secretary Tom Ridge, at Wilson’s left, and US Sen. Jeff Bingaman, at right. In foreground, Dave Nokes (now retired) explains a potential antiterrorism technology to the guests. (Photo by Randy Montoya)

Washington turned its attention to Sandia, noting that addressing this question would involve a wide variety of engineering disciplines, many of which were Sandia’s forte. Sandia had first attempted computer modeling to try to calculate the likely effects for the scenario, but soon felt that the uncertainties were too large to yield a reliable answer to such a theoretical question. Sandia then suggested that some experiments would be required to better understand the likely phenomena that would dominate the physical processes involved. The experiments would also allow us to benchmark the effects with real data.

A team of Sandians then designed an experiment in which an F-4 Phantom aircraft would be attached to a sled, where it could be accelerated on Sandia’s rocket sled track to a speed of nearly 500 mph, and then crashed into a test wall. The wall was designed to measure the most critical parameters of the complicated impact in the intended scenario. Sixteen high-speed framing cameras and a variety of sensors were used to collect data on the resultant impact.

### Modeling the 9/11 crashes

The first full-scale experiment (crash) of this type was carried out in Albuquerque in April 1988 and was a major success in meeting the desired aims. The video showing that impact has continued to be the number one, most-requested video from Sandia throughout the intervening years; and it has since been shown on TV programs (and YouTube) around the world. However, most people are not aware that the data mined from the test has been used many times since to improve the models for calculating such phenomena. At Sandia, every time we would install a markedly different generation of supercomputers (which has occurred at least every seven to 10 years), we would go back to that test data (and from a few subsequent tests funded by the US Nuclear Regulatory Commission) to refine and improve our ability for computer modeling of the physics of such events.

John Gordon and his team at the new NNSA were very aware of that history, and asked us if we could immediately try to model the crashes at the World Trade Center and the Pentagon, an idea that our computer modeling folks had already begun to do that morning following the first 9/11 crash. But, even more urgently, we discussed what structures or facilities might likely be the next to be attacked by the terrorists. Two questions loomed for all of these potential situations: (1) What would happen? and (2) What protective or defensive measures might we quickly undertake to prevent such attacks from succeeding?

At the end of what were longer conversations, on a wider variety of topics on our current capabilities to repel or recover from terrorist attacks, Gordon asked if we would assist the government effort by flying in some of our people to Washington, D.C., to handle communications with the requestors seeking help, and then in turn contact the teams back at our Lab, and all the national labs, to bring the best responses to bear in the crisis. (Most there also assumed there could be a continuing series of such attacks.) I don’t have space here to give you the full story of our immediate response, but I’m sure it remains in the minds of all of those who were part of it. We spent the rest of the morning identifying who ought to go, and who would lead from home, a task we completed by about noon.

Roger Hagengruber [then senior VP for National Security and Arms Control] was asked to lead the overall Sandia response effort in Washington, but the next crisis we faced was how to get Roger and his team of experts to Washington, since all flights in the US had by then been grounded. Suffice it to say, the Sandia “can-do” attitude succeeded; our team flew across the country on a special airplane and landed at Andrews Air Force Base right outside Washington, D.C. In the many days since, Sandia’s contributions grew to be quite numerous and quite meaningful.

### Evidence of goal being realized

Let me close with two thoughts: (1) Sandia’s work on “airplanes crashing into structures” was created quite by serendipity, but our careful nurturing of these unique and intricate technologies over the years made it into a “national asset,” and (2) Our decision to grow the efforts to counter terrorism, which Sandia’s leadership embraced in the mid-1990s, was the first time we were able to realize, convincingly, what we had also proposed several years before as Sandia’s highest goal: “to become the laboratory the nation turns to first for solutions to the most challenging problems that threaten our nation and the globe.”

In the response to Sept. 11, 2001, we could see evidence of that goal being realized. Yet over time it seemed that in our strategic planning, we must anticipate key technical work to provide options before those solutions are critically needed. A corollary conclusion is that our job of helping to secure our nation’s future is one that will necessarily never be finished.

In the years since 9/11, all the NNSA laboratories have broadened their efforts from the primary mission of supporting the nuclear deterrent, but none more so than Sandia. Sandia has taken on more and more national security work, with emphasis on protecting against emerging threats, and in that process we constantly move forward along the path toward achieving the Laboratories’ ultimate destiny — which we had voiced as “helping our nation secure a peaceful and free world through technology.”

## *NNSA administrator visited Sandia as part of weapons enterprise tour*

As the state of heightened security in the wake of the Sept. 11 terrorist attack on the US extended into its second week, then-NNSA Administrator Gen. John Gordon visited Sandia to express his appreciation to the staff, particularly those who worked long hours to keep the Labs secure.

His trip to Sandia was part of a two-day tour of NNSA laboratory and plant facilities in five states to assess the status of the nuclear weapons enterprise.

Gordon made the trip to review the current security posture at each site and identify any additional requirements needed. He met with local NNSA and facility managers and members of the protective forces. He discussed unique security issues at each site and the financial and human impacts of heightened security levels.

After receiving status reports and updates from the Sandia senior management team, Gordon dropped in on the Emergency Operations Center to meet with Sandians who staffed the EOC during the early days of the crisis. He was accompanied by then-Labs Executive VP Joan Woodard and then-Div. 14000 VP Lenny Martinez. (Lenny had served as Sandia emergency director from the early hours of the crisis.) (Photo by Randy Montoya)

# US looks to Sandia to lead

## . . . says former Labs Director Tom Hunter

***By Bill Murphy***

Tom Hunter, who was head of Sandia's weapons program and also VP of Div. 9000, was in his truck on his way to work on the morning of Sept. 11, 2001, when he heard a radio report about a plane striking the World Trade Center. "I didn't attribute anything to it at the time," Tom recalls.

At the office a few minutes later, he sat down to lead a regularly scheduled Nuclear Weapons Leadership Council meeting. The group had a TV set turned on in the conference room, peripherally following the news on CNN about the airplane accident.

When the second plane hit, Tom says, "We knew there was clearly something going on. We immediately ordered the Emergency Operations Center to be activated and [then-VP] Lenny Martinez went downstairs to oversee that process.

"That was the beginning," Tom recalls, adding that "it wasn't long" before the Labs' leadership started getting calls from NNSA headquarters.

"None of us knew what the scope of the attacks was nor what the intentions of the attackers might be. We didn't know, and NNSA didn't know, if perhaps the nation's nuclear weapons complex might be part of a larger set of targets. We were alarmed, but very focused on trying to understand the situation."

### Vulnerability analysis had enormous impact

Sandia set up a wide range of response teams analyzing everything that was known about the attacks and identifying solutions that could be used right away to help keep Americans safe. Tom, for his part, mobilized people in the weapons program, who started examining issues uniquely related to nuclear weapons facilities and resources.

One task of special note, Tom says, was the effort to understand and analyze the vulnerability of critical national defense facilities done by a "tireless" team led by Jaime Moya and Tom Bickel. "These efforts were coordinated with numerous federal agencies and had enormous impact," Tom recalls.

"This was all done pretty much behind the scenes," he says, adding that "the key thing our people worked on was to identify the inherent strategic capabilities we had that could be applied to new challenges."

In the days immediately following the attacks, the three NNSA laboratories worked together very closely, Tom recalls, noting that NNSA's management of the crisis demonstrated that the then-relatively new organization was capable of handling big challenges effectively.

In the wake of the attacks — in fact, it was before noon on 9/11 — Sandia sent almost the entire workforce home, with just pockets of key people in various organizations staying on site to handle ongoing demands.

When employees were brought back in several days after the attacks, new security procedures dramatically increased the time it took to get into the Labs facilities. As a result, Tom recalls, "Our workdays were as little bit altered. We'd sometimes come in at 4 or 5 a.m. to beat the lines."

Tom says the thing that has stayed with him over the years is how, when most employees were sent home, "everyone still wanted to be there, everyone wanted to do something, everyone wanted to contribute. Keeping people home was a special challenge."

THEN LABS DIRECTOR Tom Hunter, right, hosted DHS Secretary Michael Chertoff on a visit to Sandia in 2005. (Photo by Randy Montoya)

Life at the Labs, Tom says, "was intense for weeks; I've never seen such intensity. And I've never seen everyone here pull together in such a phenomenal way."

In 2001, most of Sandia's work was still being done largely for DOE — in the weapons program and in other significant DOE-funded areas. By 2005, when Tom became Labs director, Sandia moved to be more involved in supporting other agencies besides DOE, a situation that had expanded considerably in the wake of 9/11.

"I saw that as an area to push the Labs into more aggressively," Tom recalls, adding that then-Executive VP Al Romig was especially effective in fostering broader engagement beyond DOE. And, Tom adds, not all the new work or new relationships were directly related to antiterrorism work, although there was plenty of that. As an example, Tom says, Sandia's role in cybersecurity began to grow. "Cyber is still a primary threat to the nation and one that we are still deeply involved in," Tom says.

As Labs director, Tom saw his own role changing as the Labs' engagement increasingly extended beyond DOE.

"Who we were and what we could do became much more apparent to other federal agencies" by the middle of the post-9/11 decade, Tom says. Much that Sandia did —and does — to protect the nation is not a matter for public discussion, but an occasional high-profile demonstration of the Labs' capabilities helped bolster Sandia's reputation with key agencies.

As an example, Tom cites the 2008 shoot-down of an errant satellite. Using its Red Storm supercomputer, Sandia helped assess the ability to destroy the satellite and the best way to make sure it was destroyed with a single shot. The shoot-down was successful, adding another welcome boost to Sandia's growing reputation beyond DOE.

Sandia, Tom notes, has stated in its strategic planning the intention to be "the laboratory the nation turns to first" to solve the toughest technical challenges. In the post-9/11 decade, the Labs went a long way toward achieving that goal.

9/11 didn't just change the balance of work at the Labs; it also changed the way the work was done and the way the Labs was managed.

"We did a lot more business with a lot more customers," Tom says. "And that meant a lot more projects, some bigger, some smaller; some with complex security requirements, some with high engineering rigor or high manufacturing rigor. We had dealt with those kinds of factors in our weapons work over the years; we were now engaging with new customers with similar requirements."

Those requirements propelled the Labs toward embracing the ISO 9001 model, which establishes rigorous, measurable quality standards in both processes and products.

So, yes, Tom says, 9/11 did ultimately affect the way Sandia conducted its business, "but it didn't change our fundamental values."

In the latter part of the post-9/11 decade, Tom says, Sandia was leading an effort to make work for others (WFO) — that is work for non-DOE agencies — "a valued proposition."

WFO, Tom recalls, "went from discouraged, to tolerated, to supported, to endorsed [within DOE ]. . . and that change in approach from DOE represented a big change in how we worked with other agencies." That change, which has facilitated engagement with a wide range of new customers, as much as anything, has helped make Sandia a true national security laboratory, Tom says.

As the nation continues to respond to the challenges of the post-9/11 world, Tom says, "the absolute single most important thing Sandia can do" is have the best possible people diving deep into technologies that can have long-term security impacts.

"Hiring the best people, people motivated to serve the nation, represents the best contribution we can make," Tom says. It is important, too, that Sandia look beyond immediate challenges — important as those are — and continue to build fundamental capabilities over time. With a broad base of capabilities, a deep pool of the best people, and a commitment to national service, Tom says, "you can apply yourself to virtually any problem the nation experiences."

### Role hasn't really changed

But there's more. Sandia needs to think beyond taking on a list of tasks; it must lead.

"So many of the challenges we face have a technical dimension," Tom says. "Our own elected leaders, our nation's policymakers, look to us for understanding, look to us to provide leadership in addressing these challenges. We must embrace that role. It's essential, really."

While the nature of threats facing America has changed over the years, in a curious way, Sandia's role hasn't really changed at all. Right from the inception of the Cold War, Sandia's very existence served as a deterrent to the nation's enemies. Many Americans, including some in leadership positions, have thought that the very concept of deterrence is a Cold War artifact. Not so, says Tom. "Deterrence is much broader than nuclear weapons . . . our adversaries understand that places like Sandia exist and that people like Sandians are working overtime" to foil their plans.

"Basically," Tom says, "our role is to deter them and outsmart them and to ensure that there is never a technological surprise we're not ready to respond to."

As its service to the nation continues to evolve to meet 21st century challenges, Tom says it is important that Sandia be recognized "not just for what we do but for who we are." And who we are, he says, is a unique institution that exists to serve the nation.

"We serve the country and we support the Department of Energy," says Tom. "The Laboratories are special entities; our people are not federal employees, nor should we be viewed as a contractor focused on profit or fee. We are a unique federally constituted entity that exists and is motivated only to serve the nation's interests."

# 'We could help, and we would'

## Sandia VPs reflect on 9/11 and its impact on Sandia

*Note: At the request of the* Lab News*, several VPs shared their thoughts about how 9/11 affected them personally and how it has affected Sandia and its mission. Here are their comments:*

### Jerry McDowell, executive VP and deputy Labs director for national security programs

On Sept. 11, 2001, I was director of the Integrated Military Systems Center and actively engaged with DoD on providing innovative products and services in support of our military. I still remember the sense of astonishment I felt as I watched television coverage of the airplanes colliding with the World Trade Center and then later the attack on the Pentagon.

In an instant, I felt personally vulnerable, angry, and frustrated that we had not anticipated this and done more to help protect our citizens. These feelings grew even more intense as I soon made trips to Washington, D.C., and experienced new airport security rules and saw firsthand the damage to the Pentagon.

Almost overnight, all the old rules were out and new ways to do business were being created almost hourly.

On Sept. 12, 2001, Sandia was closed except to a few senior leaders who convened in a conference room to discuss what we could offer the nation. I was asked to join the group and it became clear that while we all felt anger and sadness, we had a job to do and just the fact that we were moving quickly to provide solutions was a tonic that helped start the healing process. We could help, and we would. Of course, every employee felt the same way and it was and continues to be a great source of pride that Sandians step up when challenged.

As a laboratory, we made many contributions to what would become the war on terror. Many of our greatest contributions remain cloaked in secrecy, but you may rest assured that Sandia has made significant contributions to our nation.

JERRY MCDOWELL

In 2005, Sandia formed the Defense Systems & Assessments Division Strategic Management Unit and I was named VP. As a result of 9/11, we saw the opportunity to bring our support for DoD and other security agencies into alignment, including our work in support of cyber, intelligence, space systems, and the military services. Many great teams of Sandians were formed and over the past decade we have helped our warfighters and intelligence operators prevail in a countless number of engagements with terrorists.

When the DSA SMU was formed we adopted the motto from our dollar bill, "*Novus Ordo Seclorum*": a New Order for the Ages. I congratulate all Sandia employees who contributed to this great cause, and in the process transformed us into a true national security laboratory that is relevant and open to the new security challenges our nation faces.

*(Continued on next page)*

# 'Sandia became a resource for the war on terror'

*(Continued from preceding page)*

SHOWING THE FLAG — John Yip (4825) trains for the Flag Across America run sponsored by American Airlines and United Airlines. The run began in Boston on Oct. 11, 2001, and ended in Los Angeles on Nov. 11, retracing the scheduled route of two aircraft hijacked on Sept. 11. John carried the US flag on a stretch between Moriarty and Tijeras Canyon. (Photo by Randy Montoya)

### Jill Hruby, Div. 6000 VP and head of the International, Homeland, and Nuclear Security Strategic Management Unit

JILL HRUBY

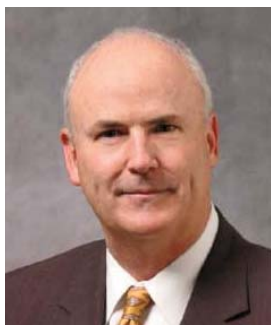
The 9/11 attacks, followed by the anthrax letters, added new dimensions to the US national security landscape in the minds of Americans. From a threat perspective, air transportation was seen in a new light and bio threats moved into the public view. On the adversary front, organized nonstate actors, individual terrorists, and domestic insiders all suddenly became more relevant. We shifted our thinking from response forces being the US military to our response forces including first responders and the general public. From both the actual events and the associated government response, Americans replaced their fears from the Cold War with fears about terrorists and religious extremists.

Sandians were ready to engage! We were immediately able to label many of our activities initiated during the 1990s (or earlier) aimed at addressing emerging national security threats. And within about a year, we had a new government agency that was encouraged to use the DOE national labs. Sandia became a resource for the war on terror — an activity we considered a long-term mission.

Today, there are notable differences in Sandia as a result. We moved from a nuclear weapons lab to a national security lab, a transition that is now woven into our culture. The national security mission attracts new talent to our Laboratories, and has greatly expanded the amount of work we do for agencies other than the NNSA. The way we think about national security is expansive, and we anticipate new threats in a much more sophisticated manner.

Mainline skill sets at Sandia now include biology, cyber, infrastructure security, and human factors. We are a part of the nation's response to emergencies and incidents far beyond nuclear events. Our engineering thought processes now include concept of operations as well as dynamic threats, resilience, and acceptance by the public.

We find ourselves in an exciting time, with significant work to do on the nation's nuclear deterrent combined with the war on terror. But I also think we all sense changes are around the corner. The ability to perform risk assessments and prioritize needs, efficiently execute, and anticipate the next event that will once again change our landscape are challenges we have now accepted.



MATT O'BRIEN

### Matt O'Brien, Div. 10000 VP and chief financial officer

The aftermath of 9/11 brought a surge of patriotism and pride in what we do at Sandia. Many areas of work being performed by Sandia took on greater meaning, including the work we do in Div. 10000.

Since the events of 9/11, Sandia has taken proactive steps in preparing for possible business disruptions. Fortunately, much of the work the business community prepared for Y2K could be used in the development of the business continuity plan. The controller organization identified the critical business functions of the Laboratories and implemented a continuity plan to ensure vital business processes can proceed in an emergency. Some of these processes include processing employee and vendor payments, local, state, and federal tax liabilities, employee reimbursements, and 401k contributions. Business continuity planning is maintained and tested quarterly to ensure the plan is updated and remains viable. The business processes affected by a disaster are being expanded to provide more capabilities to keep the Labs running as close to normal as possible during an emergency.

Other specific changes made in Div. 10000 include the increased sensitivity and understanding of the need for security alerts and the ability to track Sandia travelers and bring them home. In the area of transportation, commercial driver's licenses and hazardous material endorsements have become highly regulated and have added numerous requirements to our processes.

In Div. 10000, we have renewed inspiration and a sense of united determination. We are proud to work at Sandia and proud of the continued contribution we are making to our nation.

### Steve Rottler, Div. 1000 VP and Chief Technology Officer

*Steve Rottler was Director of New Mexico Weapon Systems Engineering in September 2001.*

On the morning of 9/11, I was in Albuquerque, scheduled to catch a morning flight to San Diego for a presentation and then to catch an afternoon flight to Washington, D.C.

On my way to the airport, I stopped by my office for some papers I needed; as I was walking out the door, my wife called and said a plane had flown into the World Trade Center. I assumed it was just a very unfortunate accident.

STEVE ROTTLER

As I walked into the airport lobby, the flight status board was showing: "Delay. Delay. Delay." About that time, on the TV monitors, we saw that another plane had hit the World Trade Center. It quickly became clear we were under some kind of terrorist attack and I also realized there was no way my plane was going anywhere that day.

I rushed to get back on the base before they closed the gates, which I knew would happen as the implications of the attack became clear.

I would say that the 9/11 attacks hastened our transition from a nuclear weapons laboratory to a national security lab. Thanks to some prescient lab leadership, we'd started on that trajectory 10 years before so that on 9/11 we had capabilities and technologies that could be deployed right away. Our response in the immediate wake of the attacks was a proud moment for us; I don't know that I've ever been more proud to be a Sandian.

The terrorist attacks posed huge challenges for the Laboratories. Because of our diverse capabilities — which we had developed over several decades as a direct result of our nuclear weapons mission — we began to engage with a broad new set of customers with a broad set of needs and requirements. These new relationships brought growth to the Labs, with new work and new funding. The challenges were very energizing but they also brought new pressures. The demands were intense and the urgency was high. The way we stepped up was a real measure of a national laboratory.

Sandia has always valued research that is integrated with real-world, practical solutions to national challenges. 9/11 very quickly became an important reference point for that integration. Cyber is a great example; it's a research area where I see some of the best integration between research and program execution for specific customers. What you see in cyber, in particular, but increasingly across all our mission space, is one shared set of objectives.

After 9/11, there was a great deal of clarity across the nation about the new threat we faced. There's always a risk that the nation will lose some of that clarity. Our role as a national laboratory is to ensure that we don't lose that focus, and that we not get caught by surprise again.

### Mike Hazen, Div. 4000 VP and chief security officer

Like me, I'll bet your September 11, 2001, started like any other duty day, with expectations of meeting a hectic schedule and completing a few of the tasks on the to-do list.

MIKE HAZEN

I sure didn't expect that our nation and freedom would, in a few short hours, be under attack, a vicious and cowardly attack on our own soil. 9/11 was for us all a day we'll always remember and recognize as a life-altering day.

On 9/11, I was a colonel in the Air Force and serving as the 88th Air Base Wing, Commander, Wright Patterson, Ohio. The 88th provides support and services to one of the largest, most diverse, and organizationally complex bases in the Air Force. I sat in my office "pushing paper" when both my vice commander and civilian deputy burst in to see if I was watching the events of the day unfold.

Together we watched images of the World Trade Center that will forever be etched in our minds. The silence was broken when the second aircraft hit. At that moment we all knew and said at once our great nation was under attack and at war. We were a ready wing, one that drilled and practiced continuously for contingencies of all kinds, but nobody had ever even considered such an event as was unfolding that day.

We formed our battle staff, locked the base down and went into an advanced force protection condition. The initial responses were to protect the base and its assets, but quickly transitioned to supporting the local community, providing air and medical support and readying forces for worldwide deployment. What I'll always remember is how everyone worked around the clock as one team supporting our nation. Under the worst possible circumstances everyone performed flawlessly, selflessly, and with service above and beyond self.

In my office here at Sandia is a portrait of a flag raised by the first responders to Ground Zero. In the background of the picture the artist has the responders casting a shadow that becomes the image of the Marines during World War II raising the American flag on Mount Suribachi after the bloody fight for Iwo Jima. This great portrait with the inscription "United We Stand" is a constant reminder to me of people called to serve this great nation.

I'll never be able to express my appreciation adequately to the families, first responders, military, civilians, and yes, every single Sandian who serve America daily. 9/11 will always be a day of remembrance, but it should also be a day when we rededicate ourselves to service to the nation and its lasting values.

For comments from VPs Rick Stulen (8000) and Pat Smith (9000) about 9/11 experiences at Sandia/California, see related stories beginning on **page 3**.

# Strategic plan addresses post-9/11 challenges

*(Continued from page 1)*

***LN:** Did experiencing 9/11 while you were overseas and away from home perhaps give you a different perspective on America's vulnerabilities in the post-Cold War environment?*

**PH:** Being in the UK when it happened, I think maybe I had a better sense of how much the world looks to America, and here the world looked to an America that was damaged, that was not as invincible as it might have been on the 10th of September. You also gained a sense of how important America is in the world.

***LN:** Has the post-9/11 security landscape shaped your thoughts about Sandia's strategic direction?*

**PH:** Absolutely. As you know, our leadership team recently finalized a set of strategic objectives that project us forward based on where we are as a laboratory today. And certainly, where we are in 2011 has been fundamentally affected by the events of 9/11.

Just take a look at the aggregate defense budget, including intelligence. That budget has increased dramatically — and I'm not even talking about the money that's been allocated to conduct two wars. That increase has definitely had an effect on us; it's given us the opportunity to work on a broader set of challenges and make broader contributions to the nation's security.

But beyond that, and in a more basic way, the past decade has changed how we view ourselves relative to both our nuclear weapons mission and to our broader set of missions. Our strategic objectives reflect that changed perspective, emphasizing that in the post-9/11 world, our mission diversity is an asset in our ability to serve the nation. But we have to be mindful of leveraging our diversity in a constructive way. If we treat our nuclear weapons mission and our other national security work as separate and unrelated, I think we lose a critical focus. That's why we now have only one programmatic executive VP [Jerry McDowell]; in my view we are a national security laboratory first and foremost that has a unique nuclear weapons responsibility and then has other programs it executes that are part of an overall national security mission. Our weapons work and other national security work should never and cannot be thought of as separate; they have to be managed in an integrated way.

***LN:** You and the leadership team have identified five strategic objectives. Can you get specific about how the objectives are going to move us in a strategic direction that emphasizes our role as a national security laboratory?*

**PH:** As we've just discussed, most Sandians understand how the post-9/11 world has helped define us as a national security laboratory. It's important to emphasize, though, that we still have a unique nuclear weapons mission that is very much a core part of who we are. Our first strategic objective makes the point plainly: **"We will deliver with excellence on our unique nuclear weapons mission."**

Some — not necessarily at Sandia — have asked whether nuclear weapons are as important to national security today as they were in the Cold War. After all, they say, what do nuclear weapons have to do with the world as it is now? Aren't they a relic of the Cold War?

If you probe deeper and think about Iran's pursuit of a nuclear capability, think about the issues of proliferation, a dynamic that was very much affected by 9/11 and our nation's response to it, you have a world in which nuclear weapons still have a hugely important role in strategic deterrence. That role has been recognized explicitly in the president's 2009 Prague speech [on nuclear disarmament as a worthy goal] and in the 2010 Nuclear Posture Review.

In pursuing that first strategic objective, we're in the midst of a modernization effort in the nuclear weapons program. In that effort, Sandia will be called upon to both lead and produce in an unprecedented way, in a way we have not had to do since before the end of the Cold War.

So the first objective calls us to a higher level of leadership. I can't overstate how big a challenge this effort will be, what a stretch it will be for us. If we are to succeed, we'll have to bring to the task everything we've got, everything we've become good at in this diversified Laboratory over the years.

Needless to say, the prerequisite for success in our first objective is that we also succeed in objective number four, that we **excel in the practice of engineering**. Our customers in the weapons program and our other major programs demand the absolute highest standard of excellence, as they should, because there is just no margin for error in matters that affect the security of this country. As we move forward, we need to recognize that engineering in the 21st century assumes a base of exceptional science and the ability to integrate science into our engineered products.

The post-9/11 world has presented us with a new set of national security challenges that require new solutions and new engineering approaches. The nation expects, and we must demand of ourselves, that we deliver those solutions by building on and continually improving the base of excellence we are known for.

***LN:** The new set of strategic objectives talks about **amplifying our national security impact**. Isn't that implicit in the objectives you've already mentioned?*

**PH:** Probably, but we [the Labs' leadership] felt it important enough to explicitly make it an objective. We have so many skills and abilities that we can go in many different directions, some of which we should go in, some of which we shouldn't. To me, amplifying our national security impact is all about how we leverage our diversity in a strategic way, gaining a greater focus, a greater recognition in Washington and amongst ourselves about where should we concentrate our capabilities for maximum impact.

## Strategic Objectives

1. **Deliver with excellence on our commitments to the unique nuclear weapons mission**
2. **Amplify our national security impact**
3. **Lead the complex as a model 21st century government-owned, contractor-operated national laboratory**
4. **Excel in the practice of engineering**
5. **Commit to a learning, inclusive, and engaging environment for our people**

***LN:** We've talked about three of the five objectives; there are a couple of others.*

**PH:** The third objective [i.e., objective number 3 in the list of five, **"Lead the weapons complex as a model 21st century government-owned, contractor-operated (GOCO) national laboratory"**] is, to me, about both taking advantage of an opportunity and then holding ourselves to the highest standard of operations.

The leadership in DOE and NNSA want to reinvigorate the GOCO model, a model developed in the very different operational era of the 1950s. That model, useful as it has been, cannot be just taken from the 1950s and dropped into our current environment.

As the largest laboratory and certainly the largest laboratory when you look at nonnuclear operations, one should expect us to lead, the Department should expect us to lead, in bringing this model into the 21st century.

As leaders, we need to be mindful about the standards we have for the efficiency of our business processes, and for the strength of our cultures of security and safety. While I think those cultures are strong, they can always be stronger. And also I think we face the challenges any commercial business faces today in dealing with our cost parameters and the effectiveness of our operational space and business space.

Our workforce has seen us take on some of those challenges on health care, the pension plan, the way we do performance compensation and job classification. All of those efforts are intended to take us to a higher level of performance that includes being on a stable financial basis as an institution. People should not underestimate the importance of excelling in this objective as almost the entry ticket for the continued strength of our programmatic position.

***LN:** Okay; and the fifth objective?*

**PH:** The fifth objective [**"Commit to a learning, inclusive, and engaging environment for our people"**] might sound like a statement of the obvious but sometimes the obvious is so obvious you forget about it, right? Even with the challenges I talked about earlier, we must constantly ask how we can make sure we're focusing on things that strengthen the work environment for our people. And that has to do with how we support learning programs, how we support the facility base and the environment where our work is done, how we support engagement in the community, how we support work-life interaction. Any of these elements has a soft character to them, but in aggregate, ensuring the environment for our people requires focused leadership attention and concrete actions. That is why we've made this issue one of our five strategic objectives.

***LN:** In thinking about our strategic objectives and where we're going as a laboratory, I wonder: In the post-9/11 world is there anything like the sort of day-to-day urgency in our mission work that characterized our work during the Cold War?*

**PH:** Oh yes. It's sometimes hard for us to talk about all of the things that we're doing post-9/11, but I can tell you that there are many activities here that have saved the lives of our military personnel. When you're working on things that have that kind of realness to them, there is a sense of urgency. Absolutely.

And when you know you're on the hook to put in place a technology that has a fundamental impact on our national security capabilities at large, there's an urgency to that.

I would remind everybody, too, that in the work we do in nonproliferation and in energy, for example, the faster we bring solutions, the sooner we can provide the policymakers with technology options that bolster the nation's security. So there's an urgency there, and I think the folks working in those areas feel that urgency.

And then I would come back to our unique nuclear weapons mission: I don't view the importance of that deterrent as any less significant than it was during the Cold War. If anything, today, we're in a more complex environment, more dangerous, and the nation's extended strategic deterrent is still vitally important to the world and to our allies. In this post-9/11 world, our allies — and our adversaries — are looking to us, watching how we take on modernization [of our weapon stockpile], because they see that as an indicator of the strength of our deterrent and of our commitment to that deterrent. That falls right in this Laboratory's lap. And I know our workforce senses that because I know how hard they're working right now on these programs. So, yes, that spirit of urgency is there; very clearly, it's there.

***LN:** You have described our new strategic objectives as game-changing. What do you mean by that?*

**PH:** That phrase is perhaps overused. In this context, for me, it means that in three to five years in every one of those five areas [defined by the strategic objectives], the way the Laboratory operates must be different; we must be changed in each one. We have to deliver and train and bring a whole new generation to the stewardship of our deterrent; we have to effect that change. We have to bring a new level of focus, strategic recognition, and investment to our diversity. We must be a more effective, efficient, and stronger cultural organization with respect to the way we operate under the GOCO model. When someone asks where to find the best national security product engineering, based in science, the answer rolls off their tongue — it's Sandia. And then, five years from now, we want our people to recognize that we've created an environment that amplifies the uniqueness of what Sandia has to offer and it recognizes them in a way that's more tangible than we've done in recent years. All of these things are about being at a different place than we are now.

***LN:** Do you think we're anywhere near there?*

**PH:** Oh yes, absolutely, we're near there, without question. But near there, occasionally there, isn't as good as always there. And that's where we're headed. It's not that where we are today is bad in any way. This is a great place. We do phenomenal things. But the nation needs for us to be even better, our people need for us to be even better, and we will be.

***LN:** How confident are you in that?*

**PH:** I'm very confident. We have a great leadership team. If you look at the talent we've brought to the Laboratory in the last three years, I mean, it's just phenomenal. The new talent we've brought into this Laboratory is nothing but exciting. So I don't know how not to be optimistic about us moving forward. I am very optimistic. Between our mission, our talent, and unfortunately, the diversity of the nation's challenges, Sandia is an important and great place to be. And we just want to make it an even better place to be.

# Anticipating the worst

## . . . and mapping out mitigation or response strategies is in Sandia's DNA

***By Renee Deger***

Less than a day after Sandians evacuated midmorning on Sept. 11, 2001, pockets of professionals throughout the Labs were back at work, considering various US facilities, and asking the same question over and over: "What would happen if an airplane struck?"

The targets they explored in the first days were the most obvious — government buildings, military installations, nuclear power plants. Within weeks, more Sandia teams were asking more complex questions, the "targets" were more diverse, the "weapons" more varied, and the "adversaries" more enigmatic. Within months, whole organizations in Sandia were devoted to constructing a new — and permanent — definition of national security.

Ten years later, what had been the response to 9/11 is now an operational reality for many Sandians. The event brought lasting shape, definition, and relevance to a host of specialties, program areas, and even solo projects that anticipated and explored a broad range of threats against the US and its allies. National security now explicitly includes homeland security and defense, which have developed into both a collection of dedicated programs and an overarching mission space that draws from expertise and centers across the Labs. The expanded national security mission also has helped Sandia cultivate deeper, more collaborative interactions with end users, leading to more usable solutions and greater innovation and intensifying Sandia's role in anticipating risk.

IN THE WAKE of the 9/11 attacks, a broad range of Sandia capabilities, including expertise in materials, sensors, and explosives containment, was brought to bear in the emerging war on terror. (Photos by Randy Montoya)

It's important to note that there are few activities that Sandia now undertakes, as a result of 9/11, that weren't under way in some shape or form prior to the attacks. It's in Sandia's DNA to anticipate worst-case scenarios and map out mitigation or response strategies.

The rise of terrorist activities in the late 1960s had prompted Sandia to explore threats by small groups of nonstate actors alongside the traditional, Cold War hazards. This included, of course, the ever-present threat of some evildoers getting their hands on a nuclear bomb. But prior to 9/11, threats were typically framed as more limited in their impact or as accidents, like a nuclear power plant meltdown or a chemical spill, and likely never to happen, or perhaps only in the dim, distant future and, if so, then certainly somewhere else.

"9/11 changed the perception of terrorist activity," says John Vitko, who retired in 2007 but played a major role in shaping some of Sandia's homeland security programs as well as the federal agency that now bears that name. "Before 9/11, terrorist acts were viewed as activities that drew attention to a cause or were aimed to strike terror, not necessarily to cause widespread death or alienate possible constituents."

### Nontraditional partners

The legislation creating the Department of Homeland Security, which rolled 22 federal agencies under one umbrella, specifically sought contributions from the national labs. So when virtually every branch of the new agency began questioning their defenses and preparedness, Sandians were suddenly working with new populations of professionals, from border, immigration, and customs officials, to airport security screeners, local law enforcement, and emergency managers.

The kinds of questions these new stakeholders posed challenged Sandians to adjust the way they studied problems and created and tested solutions, says Holly Dockery (6020), deputy to VP Jill Hruby of the International, Homeland, and Nuclear Security Strategic Management Unit.

This became clear during the process of creating the new DHS. Holly, John, and John Cummings, who is also retired from Sandia, were part of a very small cadre of scientists drafted primarily from the DOE labs to build the Science and Technology (S&T) Directorate of DHS from scratch, implementing the ideas the National Academy of Sciences raised in its 2002 report, *Making the Nation Safer: The Role of Science and Technology in Countering Terrorism.*

### Supporting the DHS 'civilian security' mission

"We were making a broad new push for a range of science and technology that would support the new 'civilian security' mission of DHS," Holly says. "Most of us thought security trumped everything else. But this was no longer just about security. It was about the kind of science and technology that could help balance security with the need to maintain a normal life. But it was also about enhancing routine, legitimate activities — travel, trade, and immigration.

"That was not security the way DoD defines it," Holly continues. "On a military base, it doesn't matter if scanning every person and vehicle by hand stops traffic for two hours. But in an airport or an operating cargo port, you just can't do that, and [Customs and Border Protection] won't do that."

This new dynamic brought Sandians closer to the operational dynamics of the environments they were assessing for risk or seeking to secure with new plans and solutions, and to great benefit. To be sure, Sandia has long employed a systems approach to developing solutions for complex environments. But the expanded practice of factoring in greater operational dimension for a broader range of users has strengthened Sandia's expertise and enhanced its reputation as a leading systems engineering lab.

Along with this new cast of characters came dramatic new working environments and test beds, like fully functioning airports, active ports, and operating subways. As Larry Brandt (8110) recalls, the projects that emerged after 9/11 broadened the nature of Sandia's work.

"In the past, our focus was on national security missions primarily for federal and military users," Larry says. "With the events of 9/11, we greatly expanded our role with state and local entities and with new kinds of infrastructure owners. The old skill sets were adapted and augmented to deal with new customer environments."

A case in point was a two-day operation in January 2006, led by Sandia and Lawrence Livermore National Laboratory, that used the San Francisco International Airport as a test bed for a program called Protective and Responsive Options for Airport Counterterrorism (PROACT). The program developed and tested procedures for airports to respond to a biological or chemical attack. The demonstration involved 120 officials from local, state, and federal agencies.

Larry contributed to the systems analysis activities that helped define the program. Eye-opening for Larry during that process, he says, was how difficult it was to implement changes in chemical and biological readiness in light of the numerous daily concerns present in a metropolitan airport. "We had to adapt to operational realities, and that was often quite challenging," Larry says.

### New programs, new tools

Sandia's response to the new world that dawned on Sept. 12, 2001, opened with a flurry of activity helping longtime partners like DOE and DoD assess and understand their risks. But that was just the beginning. The areas of expertise that were called upon — threat identification and characterization, risk assessment and management, attack response and restoration planning, chemical and biological detection, and physical security — and the tools applied — security solutions like sensors, detectors, and weapons systems and modeling and simulation (mod/sim) software — to name just a few, exploded as more public and private entities tasked Sandia with helping them address their individual concerns.

Initially, the questions centered on Sandia's expertise in protecting critical assets. Senior Manager Basil Steele (6500) spent the first days following the attacks assembling information on a range of risks and mitigation strategies for a congressional report. Decades before, Sandia had begun developing a number of physical security specialties to support the nuclear weapons enterprise, but most were in maintenance mode by 2001. The post-9/11 probes prompted the US Air Force to renew close ties with Sandia security experts, particularly in the overhaul of security at multiple US nuclear weapons installations. The Navy followed with similar tasks. This work continues today.

"People had stopped thinking about security as something that had to continue to evolve," Basil says. "9/11 put that back into focus and spurred all kinds of activity in developing next-generation protective technologies, like weapons systems, early detection devices, access-denial mechanisms, and simulation and modeling tools."

Stephen Attaway (1525) worked closely with Basil on expanding the use of modeling and simulation to run system scenarios that could help identify tools for further testing. That was a major change that came about as a result of 9/11. The tools developed for the Advanced Simulation & Computing program were originally built to study weapons performance and safety. But the demands following 9/11 — the expanded number of queries, the wide range of scenarios and facilities explored, the kinds of solutions under examination — required wide-ranging applications of simulation and modeling capabilities that continue to be developed today.

"We didn't have in the job description anything like studying events like 9/11, but because we had built the large-scale computing resources, we could apply the tools to simulating terrorist attacks," Stephen says. A longtime code writer, Stephen says the physical security questions brought him around to the other side of the desk, and he began studying vulnerabilities and researching mitigation strategies to see what would work. The influence of mod/sim capabilities on moving projects along was astounding, he says.

"We were able to use mod/sim to help people get beyond the denial stage that they have a security problem and see solutions that would work," Stephen says.

Civilian security systems analysis exploded as well, as a result of the attacks. The security systems analysis group has since spun off multiple new groups dedicated to securing a wide range of physical locations and critical resources as well as partnering with other countries.

Initially, Sandia analysts were asked to examine the security of potential civilian terrorist targets, including major manufacturing facilities like chemical plants, large infrastructure facilities like dams, and even national monuments. Greg Wyss (6612) was looking at the reliability of the national telecommunications networks when the attacks happened. He was drafted for an urgent project for the Nuclear Regulatory Commission (NRC) — a 60-day probe of potential aircraft vulnerabilities of all 106 US nuclear power plants. The NRC then asked for a two-year, in-depth study of the two most common types of nuclear power plants, which was the largest project Sandia had done for the NRC in decades.

"Sandia's analysis, testing, and modeling and simulation activities for the NRC elevated our credibility dramatically," Greg says. "Our work supported the NRC's aircraft security rulemaking, and we continue to assist internationally on the topic."

Emerging new threats probed in the wake of 9/11 didn't eliminate fears of a possible nuclear disaster. In fact, the events dramatically heightened fears that a nuclear weapon would be detonated in the US or in an allied nation. This drove a major expansion in programs and technologies that could detect or track the movement of nuclear weapons,

*(Continued on next page)*

# Constructing a new definition of national security

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precursor materials used in their manufacture, and even radiological materials used in medical fields.

Sandia had developed radiation detectors for many years prior to 9/11 but they were mostly big, expensive, stationary, and used by specialists in targeted locations, like military bases. In response to new demands for radiation detectors in civilian locations, Sandia began exploring solutions that were smaller, cheaper, more mobile, and easier to use. And, perhaps more importantly, the new technologies were capable of translating information about the materials being detected into the kinds of data points that specific end users needed.

"The primary activity was that the analysis software became more reliable," says Dean Mitchell (6633), a veteran of Sandia's radiation-detection projects. "We were strongly involved with that. "Dean says that prior to 9/11, the Sandia gamma detector response and analysis software (GADRAS) was used by about a dozen people to support internal projects. Now, hundreds of people inside and outside the Labs use the software, which has been refined and enhanced over the past decade.

## Bio takes shape

While program areas throughout the Labs experienced tremendous growth after 9/11, the most dramatic visible change took place in biological threat reduction, a collection of capabilities and projects under the Countering Biological Threats umbrella. The programs provide the science, technology, and technical policy solutions to confront on a global scale the entire lifecycle of a biological threat — from awareness to prevention, preparedness to detection, and response to recovery. Some of these programs didn't exist 10 years ago and others were small projects with single principal investigators.

Activities and programs aimed at prevention, for example, had barely taken shape until agencies throughout the government started examining their security postures in the first days after 9/11. At that time, Senior Manager Ren Salerno (6820) was a technical staff member working solo and trying to get laboratory managers and security specialists worldwide to pay attention to biosecurity.

The day before 9/11, which fell on a Tuesday, Ren was wondering whether he was ever going to get any real traction with his fledgling program. The Sunday after 9/11, he was on a plane to Washington, D.C., to meet with the deputy secretary of agriculture to discuss security measures for the nation's biological research labs.

While those conversations began as a result of 9/11, it's nearly impossible to separate that day from the impact of the series of anthrax letters mailed in the following weeks. [The 10-year anniversary of the anthrax letters will be examined in the Sept. 26 issue of *Lab News*.] But it's fair to say that in that one-month period in 2001, 9/11 sparked the sudden demand for biosecurity expertise, and the anthrax letters wrote the checks.

Within weeks of that flight to Washington, Ren's fledgling program had a couple million dollars and the job of upgrading security systems for the nation's top laboratories. "The urgency was immediate because no one knew what was going to happen and we thought any critical infrastructures and any dangerous materials were vulnerable," Ren says. "What the anthrax letters did was heighten that beyond anything imaginable."

Anup Singh (8621), who leads diagnostic research, says the event prompted him to turn more attention to biodefense detection and diagnostics, building on some of Sandia's initial projects in chemical detection. "We already had lots of projects at Sandia doing environmental detection, but until that time there was nothing at Sandia focused on the people," Anup says. "And at the end of the day that is who we wanted to save."

In 2002, Anup secured Sandia's first funding from the National Institutes of Health to develop a portable diagnostic tool that could diagnose disease from human saliva. That project helped Sandia establish a track record in medical diagnostics that has since led more new funding agencies in the biological sector to throw their support behind Sandia.

## Honeymoon period

Sandia's new reality as a national security lab that assists a diverse set of partners carries new responsibilities, particularly as 9/11 passes into the collective memory. The Labs became a focal point for the nation's leaders in first the year. Members of Congress, military officials, agency heads, and a host of other government luminaries beat a path to Sandia to learn about the Labs. Such visits still happen but not with the same degree of regularity. And shifting priorities and tough budgetary realities now, 10 years later, put a greater burden on Sandia to educate partners and government leaders as their ranks turn over. Yet the threat is constant, and history has demonstrated that vigilance in the absence of successful attacks is crucial.

"The interest was huge at first. Congress recognized the value of the DOE labs in the legislation creating DHS, and we expected that we would be treated the way we're treated by the DOE," Holly says. "That's the not the case. We're just another contractor and it's a difficult education process to help people who carry guns and badges and are constantly dealing with tactical, everyday concerns to appreciate the value of long-term research and development that is not providing immediate solutions."

Holly spent most of the past eight years working for DHS in a number of capacities and returned to Sandia in February. "To be impactful you have to really understand the needs of the sponsors and also to have the people who need the tools and the analyses really understand the value of your contributions," Holly adds. "It's a constant and ongoing education process for both Sandia and the users."

# Becoming a national security laboratory

*(Continued from page 1)*

emotions, sometimes even quite raw emotions that linger a decade after the fact.

9/11 changed America; anyone who travels by air directly experiences one of the more obvious changes. But 9/11 changed the society in other ways, some apparent and some less so.

It changed, fundamentally, the way many Americans thought about national security — and it changed Sandia.

Elsewhere in this special issue of the *Lab News*, members of Sandia leadership talk about 9/11 and its impact on the Labs; their perspectives are shared in their entirety. If their views could be summarized in a few words, it would be that 9/11 accelerated a trend that had actually begun during the 1990s, marking a transition from a Cold War-oriented nuclear weapons laboratory to a 21st century national security laboratory.



"The past decade," says Labs Director Paul Hommert, "has changed how we view ourselves relative to both our nuclear weapons mission and to our broader set of missions. In my view we are a national security laboratory first and foremost that has a unique nuclear weapons responsibility and then has other programs it executes that are part of an overall national security mission. Our weapons work and other national security work should never and cannot be thought of as separate; they have to be managed in an integrated way."

In 2005, the Labs formed the Defense Systems & Assessments Strategic Management Unit (SMU), tapping Jerry McDowell as VP. Jerry, now Sandia's executive VP and deputy Labs director for National Security Programs, says that "as a result of 9/11, we saw the opportunity to bring our support for DoD and other security agencies into alignment, including our work in support of cyber, intelligence, space systems, and the military services.

Over the past decade we have helped our warfighters and intelligence operators prevail in countless engagements with terrorists."

That change from a nuclear weapons laboratory to a national security laboratory, says Div. 6000 VP Jill Hruby, is now "woven into our culture." Jill, who leads Sandia's International, Homeland, and Nuclear Security SMU, says that in the decade since 9/11, "Sandia became a resource for the war on terror — an activity we considered a long-term mission. . . . . The national security mission attracts new talent to our Laboratories and has greatly expanded the amount of work we do for agencies other than the NNSA. The way we think about national security is expansive, and we anticipate new threats in a much more sophisticated manner."

Div. 1000 VP and Chief Technology Officer Steve Rottler, who was a director in the weapons program at the time, argues that 9/11 brought a new sense of clarity to the nature of the threat America faced in the 21st century. "I would say that the 9/11 attacks hastened our transition from a nuclear weapons laboratory to a national security lab. . . . Our response in the immediate wake of the attacks was a proud moment for us; I don't know that I've ever been prouder to be a Sandian."

In the post-9/11 world, Steve says, Sandia "began to engage with a broad new set of customers with a broad set of needs and requirements. The challenges were very energizing but they also brought new pressures. The demands were intense and the urgency was high. The way we stepped up was a real measure of a national laboratory."

Div. 10000 VP and Chief Financial Officer Matt O'Brien was not at Sandia in 2001, but during his tenure at the Labs, he has overseen many changes in the way the Sandia conducts its business, changes driven in no small part by 9/11. For example, Matt notes that Sandia has been proactive in planning for possible business disruptions to ensure continuity of operations.

"The business processes affected by a disaster are being expanded to provide more capabilities to keep the Labs running as close to normal as possible during a potential emergency," he says. Other business changes include implementation of new provisions to keep better track of Sandians on travel, help ensure their safety, and bring them home.

Div. 4000 VP Mike Hazen in 2001 was a colonel in the US Air Force and commander of the 88th Air Base Wing at Wright-Patterson Air Force Base in Ohio. When the scope of the attacks on 9/11 became clear, Mike formed his battle staff, locked the base down, and went into an advanced force protection condition. "What I'll always remember," Mike recalls, "is how everyone worked around the clock as one team supporting our nation. Under the worst possible circumstances everyone performed flawlessly, selflessly and with service above and beyond self."

Sandia's mission — to protect and secure the nation's safety — is as old as Sandia itself, written into the DNA of an organization that has always been motivated to provide exceptional service in the national interest.

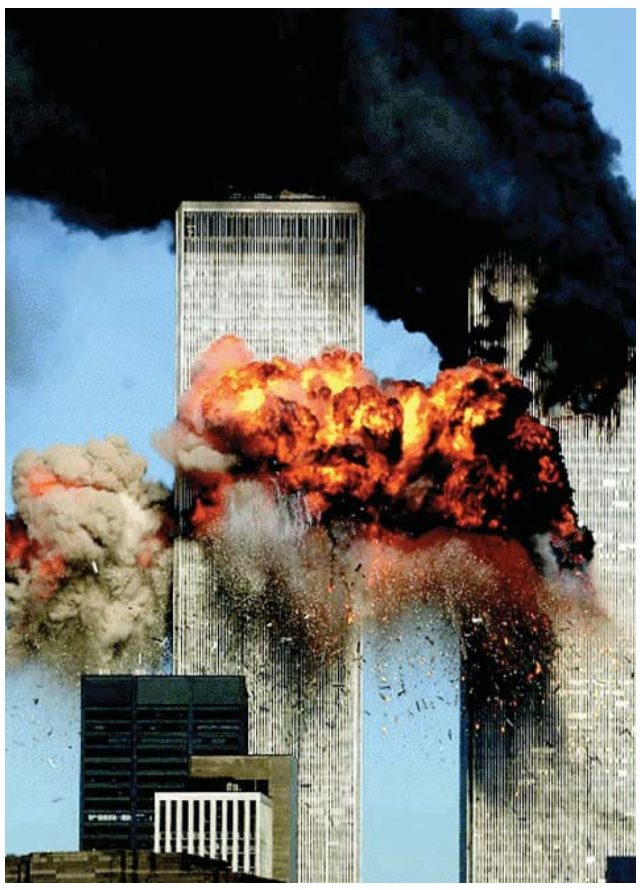
But 9/11, an attack on the homeland, added a new urgency, a spirit Jerry tried to convey when the Labs established the DS&A SMU. When the new business unit was formed, Jerry recalls, "We adopted the motto from our dollar bill, "*Novus Ordo Seclorum":* a New Order for the Ages. I congratulate all Sandia employees who contributed to this great cause, and in the process transformed our Lab into a true national security laboratory that is relevant and open to the new security challenges our nation faces."

# The lab the nation turned to:

## Sandia's security expertise tapped hours after 9/11 attacks

***Story by Heather Clark***

Years before Osama bin Laden executed the world's deadliest terrorist attacks, Sandia researchers were studying what made the US vulnerable and where threats to US security in a post-Cold War world were likely to emerge. Among these researchers was Gary Richter (8112), a systems analyst who evaluated the goals and capabilities of terrorist groups. In a 1999 case study, he concluded that bin Laden was a significant threat who "taps a bottomless reservoir of ethnic and religious discontent and funnels it against the US." As it turned out, Gary was right.



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Weeks before 9/11, Sandia and KAFB were discussing creating an open campus by removing the fence around TA-1 now that the Cold War had passed. That discussion ended with the 9/11 attacks.

* * *

American Airlines Flight 11 tore into the World Trade Center at 6:46 a.m. in New Mexico. About five minutes later, then-Labs Director Paul Robinson, who was at home getting ready for work, heard the first televised report of the tragedy.

From 1985-1988, Paul had worked on the 93rd floor of the south tower. He recalled that one of the job's perks had been a car and an underground parking spot, where he very well could have been during the 1993 truck bomb attack had fate not interceded in 1988 by having him leave New York to lead the US delegation at the US-Russian Testing Talks in Geneva.

This second set of attacks was clearly far worse. "You couldn't help but think what might have been. It was horribly shocking," Paul says. His thoughts quickly turned to the day ahead. "I headed into work because I knew we were going to be busy. I got calls at home and on the way in."

* * *

Gary was in Albuquerque for a conference when he heard the news. He was glued to the television when United Airlines Flight 175 hit the south tower at about 7:03 a.m. in New Mexico.

"I had this feeling of helplessness," he says. "I'm employed by a national security laboratory to study these things and right now at this hotel I can do no more than my own mother could do. I dedicated most of my life to fighting people like this; it's been my career, so it made me sad that I couldn't do anything right then."

* * *

An hour-and-a-half after the first plane hit, Paul says Gen. John Gordon, then-head of NNSA, called to ask for Sandia's help.

"'You guys are the ones who have been working counterterrorism the hardest,'" Paul recalls Gordon saying, "'Get some guys back here to help me handle all the requests we're getting, and the communications with all the other labs and sites.'"

Paul agreed to send a Sandia-led team to Washington, D.C., as soon as possible. He was unaware at the time that the Federal Aviation Administration already had made the decision to ground civilian air traffic.

Within hours of the attacks, the questions started. People remembered Sandia's past research, particularly a video of an F-4 Phantom crashing into a structure similar in strength to nuclear reactor containment vessels. The video took on new significance that day.

"Almost instantly, all around the country, in lots of organizations, people remembered that work," Paul says. "They were asking Sandia, 'What's the vulnerability of this facility and that facility?'"

A phone bank normally used for VIP visits was set up in the director's office to handle the mass of phone calls.

To help get answers, Paul phoned Tom Bickel (2200). The then-director of Engineering Sciences had used structural mechanics calculations to predict damage caused by aircraft hitting various structures.

Paul also organized focus groups of researchers who worked for Dennis Miyoshi, the director of Security Systems and Technology at the time.

"One of the focus groups' ideas was spectacular; an example of Sandia engineering that offers simple, elegant solutions," Paul says. The group advised using steel cable, properly tensioned and anchored, to throw back any vehicles that attacked areas containing critical buildings and personnel.

There was never any explicit threat to the Labs, but Paul says those in the director's office were working on so many issues that they "were almost unconscious of what was going on outside." That job was left to others.

* * *

Wes Martin, protective force chief of operations, heard about the first plane hitting the World Trade Center when he left home. By the time he arrived at the office, word came that a second plane had hit and he knew this was no accident.

Wes says Sandia aligned with Kirtland Air Force Base to elevate the Force Protection Condition to "Charlie plus," which describes a situation where actions are taken because terrorist activity is imminent plus additional security measures were put into place as if Sandia were under attack.

At 10 a.m., just more than three hours from the first attack, nonessential Sandia employees were told to go home.

"There was a flow of people leaving," Wes says. "It was not an insane rush. People left in a very organized manner."

By 2 p.m., the base was virtually empty and Sandia's Leadership Council met to establish who was required to report for work and figure out how to get people back.

The Emergency Operations Center was concerned about the state of Sandians who were on travel and scattered all over the world, particularly those at the Pentagon, which was also attacked that morning, killing 125 people on board the aircraft that struck the building and 64 people working there.

Charlie Thomas, who was on special assignment to DOE and was at the Pentagon that morning, recalled at the time: "We felt a tremor go through the building."

Charlie and all Sandians there and elsewhere were all right.

* * *

On Wednesday, Sandia's laboratories and offices were nearly deserted with a lone car in a parking lot that normally held hundreds. "It was eerie," says Iris Aboytes (3601), an emergency communicator that day. "It was like a hurry-up-and-wait atmosphere."

Former VP Roger Hagengruber arrived at work at 4:30 a.m. and received a phone call from Gordon, asking him if he were willing to lead the Washington-bound Sandia team and describing some of the needs he already had: take a look at NNSA's facilities, assess the risks, and look at the possibility for organized terrorist attacks and attacks using aircraft.

Sandia's security research dated back to the mid-1970s. Sandia's fingerprints could be seen throughout all nuclear portal perimeter monitoring systems, perimeter intrusion protection, double fencing, and other security measures and research. By the mid-90s, researchers were looking at the possibility of a terrorist attack to steal nuclear materials. Roger had been tapped by DOE in 1996 to conduct a number of security studies, including looking at the importance of dealing with the security of nuclear materials.

When rumors of substance spread after the attacks that there would be attacks on nuclear facilities, it made sense to call Sandia.

"I was working off of a very strong base of experts who knew a lot more about the details than I did," Roger says. "And, I was ready to help take on the concern about how to deal with the security. 9/11 increased what was already a very high priority to an urgency to make sure we had done everything we could."

* * *

On Sept. 13, a gray, rainy Thursday morning, Wes stood at the Eubank gate watching a line of vehicles waiting to return to work. Motorists handed their badges to officers at the gates for the first time and expressed their gratitude for the added security.

"We probably got more respect from the people at the gates than we ever got before that day," Wes says.

Wes, like Roger, also viewed his job in terms of a broader sense of national security. "In there," he said shortly after 9/11, "is where we're developing the technology that can help us win this thing … . Our job is to get those folks into their labs and offices as quickly as possible and make sure they have a safe place to do the work this nation needs right now."

Thursday was a busy day. Researchers say their phones were ringing off the hook. Even before 9/11, Sandia had developed systematic ways to identify security weaknesses of buildings, dams, drinking water supplies, and other possible targets. Now the nation wanted the benefits of that work.

Tom, who rode in that morning with former VP Al Romig, learned that he would be joining the team headed to Washington that day. He jokes that he had to tell Al to find his own ride home that evening.

Joining Roger and Tom was Jim Larson, then a manager in what later became Critical Asset Protection and Security. The men gathered at a corporate terminal adjacent to the Albuquerque airport, but their team wasn't yet complete.

Roger ran into a Los Alamos lab expert, who happened to be passing through the terminal and agreed on the fly to join them. Once in Washington, they coincidentally bumped into two special nuclear material production experts from Pantex and Rocky Flats who were trying to return home, but agreed to join the team when asked.

FIREFIGHTERS AND RESCUE PERSONNEL atop the rubble after the towers collapsed.

The Lear jet they took had government clearance because civilian aircraft were still grounded.

The tiny jet departed Albuquerque alone that day, headed for Andrews Air Force Base near the nation's capital. The passengers weren't afraid to be alone in the sky because they were too busy discussing how they were going to carry out their work.

Over the central region of the country, the pilot called Roger to the cockpit. "The pilot said, 'You'd better take a look at this. I've never seen anything like this before.

(Photo by Randy Montoya)

(Photo by Randy Montoya)

(Photo by Randy Montoya)

There isn't a thing in the air. It's empty.'"

Normally the screen would have been filled with midday flights criss-crossing the country, but that day it was dark.

After landing safely, they were taken to a hotel in Crystal City, Va. As they walked across the lobby, they found the typically bustling hotel deserted.

EXTENSIVE DAMAGE to a building near Ground Zero after the towers collapsed.

* * *

By Thursday afternoon, Paul had worked two-and-a-half days straight and took his first break, like many other employees who worked long hours during the crisis.

* * *

At 7:30 a.m. Friday, Sept. 14, Roger and his team were taken to a high-security vault at DOE and began calling NNSA facilities, talking to security managers, making sure contingency plans for an aircraft attack and a release of materials were in place.

"We went to work every day in an environment that was the aftermath of a war zone," Roger says.

Tom recalls: "It was very chaotic."

They looked for vulnerabilities as they worked, particularly at critical facilities. "These types of attacks not only would create a nuclear incident, but they could also damage our nuclear program," Roger says. "We looked at events that would cause death or exposure to significant amounts of radiation, that would cost a permanent or decades-long loss of a permanent facility or would cost billions of dollars to replace. Finally, we looked at things that could create an irretrievable loss of public confidence."

Working 12 hours-plus a day through the weekend, the team created a matrix based on high, medium, and low risk and a list of recommendations for the facilities in what was later dubbed *The 72-hour Report*.

While some callers found sleepy or grumpy employees on the other end of the line, once they knew why the group was calling, they helped. Team members say everyone pitched in during the crisis.

"They were fantastic. . . . Whether it was Lawrence Livermore, Los Alamos, Y-12, or Pantex, or any of the other DOE/NNSA facilities, I saw them all come together and really, really focus. They were able to overcome any differences and everybody just focused on trying to help," Jim says.

* * *

For the next few days, the mood at the Labs was one of nervousness, as it was across America, particularly when airlines returned to the skies. Wes says he helped respond to numerous false reports from employees. "It was jumpiness," he says.

* * *

On Sunday, Sept. 16, 2001, Richard Sparks, now retired from Sandia, but still serving as a consultant, arrived at Ground Zero with 650 pounds of equipment to outfit search dogs looking for victims' remains with wireless low-light video cameras and two-way radios and monitors for search and rescue K-9 handlers. Richard managed to assemble eight systems at the operating base next to Ground Zero. Mary Green (6612) joined him for three days, helping him assemble the collars and parts and coming up with several variations and improvements on the original camera collars.

Richard says he worked with search-and-rescue teams from all over the country who asked to buy the devices, but they were never commercialized. He says a company in California is interested in manufacturing them for such teams.

* * *

As a new week dawned, the calls for help from around the nation continued. Betty Biringer (5942) recalls Org. 6400 being "bombarded" with calls for their security risk methodology for federal dams, which had been completed that August. They started applying the methodology to other facilities, particularly for large metropolitan governments that called to say they had hundreds of critical structures they needed to protect.

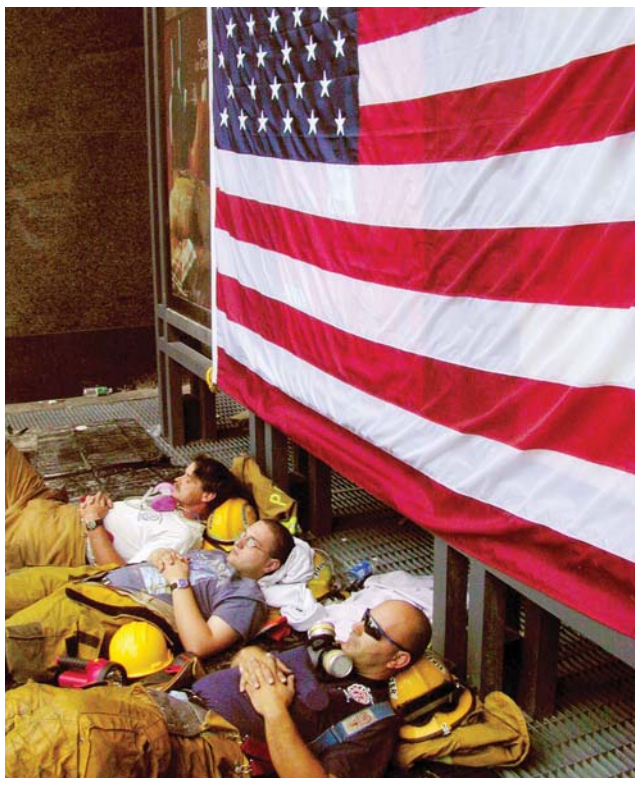
"It was pretty sobering: the realization that it was no longer a technical problem or a paper exercise; it had really happened," Betty says. "We've got to protect the nation from this. There was a feeling of nationalism among us. We all knew why we went to work every day."

Sandians also helped outside the workplace. Bruce Berry (6833), who was then a Sandia emergency planner, Troy Hamby (4136-1), Lloyd Rantanen (3333), Mike Hessheimer (1534), and Gerald Wellman (1525) were on the New Mexico Urban Search and Rescue Task Force that traveled to the Pentagon to help recovery efforts. Working 18-hour days, they shored up damaged parts of the five-story structure, searching for survivors and recovering airplane parts along the way.

"You can't help feeling anger or hate that this act was done. Of course, you can't dwell on that because you are there to do a job. But you come across remains and you wonder, whose mother was this? Whose son?" Berry said at the time.

Across town, Roger and his teammates provided a classified briefing to Gordon on their findings.

"There were a number of important things that were done because of the report," Roger says, explaining that he cannot provide details.



FIREFIGHTERS AND RESCUE PERSONNEL get some well deserved sleep.

After the briefing, the team flew home. "For those of us who had spent these feverish five days in Washington it was such a relief to get home because it had been so intense," Roger says.

A decade later, Roger remains proud about what he, Tom, Jim, and the others accomplished.

"The ability of this laboratory to contribute to this was a reflection of 30 years of capabilities and development of our understanding of how security and technology come together," he says.

But his feelings are mixed when it comes to security actions taken since 9/11.

"9/11 was a wakeup call for the country and those of us at the Labs who had responsibilities in security to say that events that we had deemed relatively unlikely needed to be more seriously evaluated in terms of finding the balance of money and security," Roger says. "As a nation we still haven't adequately dealt with that."

(Photo by Randy Montoya)

TOWER BEAMS from the fallen World Trade Center arrive in Albuquerque, where they were to be used in a new bell tower construction project at a local church.

* * *

On Oct. 5, former *Lab News* editor Ken Frazier wrote in the newspaper that he hoped some semblance of normalcy was returning to Sandia.

"Nothing is quite the same. Nor ever will be. But there seems to be a little less tension than marked those first two horrible weeks after Sept. 11," Ken wrote. "People are allowing themselves to emerge a bit from what, after all, has been an intense period of communal national mourning."

* * *

Wes went on to serve multiple Army tours, eventually retiring as an active component colonel. These tours included serving as the senior antiterrorism/force protection officer for Iraq and later as base commander of Camp Ashraf, in Iraq, where he worked closely with an Iranian opposition group based there. During these tours he continually called on Sandia for help with certain security issues.

* * *

Paul, who retired from Sandia in February 2006, says, 9/11 "changed our thinking about being the Labs the nation turns to first for solutions to tough problems in science and technology. 9/11 was a small culmination of that. We were harvesting a lot of work people had been doing for several years."

* * *

Several people, particularly those working in security at Sandia, say "normal" didn't ever return.

"I think it forever changed the way we looked at physical security because it changed the threat spectrum, I don't think it's ever been the same," Betty says.

* * *

After 9/11, Gary received calls from colleagues congratulating him on correctly stating that bin Laden was a threat before 9/11.

"I had this sense of professional pride, but I felt guilty that 9/11 had happened," he says.

Over the next six months, Gary conducted as many as 60 briefings to NATO members about his work on terrorism, but he still wonders whether he could have done more.

"Most people didn't want to hear about such things," he says. "All my life, I'll wonder, should I have pushed my ideas more strongly? Could they have made a difference?"

**This narrative of the days following 9/11 at Sandia was taken from previous issues of the *Lab News* and interviews with Paul Robinson, Roger Hagengruber, Jim Larson, Tom Bickel, Dennis Miyoshi, Wes Martin, Gary Richter, Betty Biringer, Richard Sparks, Mary Green, Iris Aboytes, and Randy Montoya.**

SMOKE pours from the Pentagon, moments after American Airlines Flight 77 struck the building.

# 'We felt the entire building shudder heavily'

## *Sandians stationed at Pentagon on /11 recall deadly attack*

### *Steve Rinaldi (5643)*

I was a US Air Force officer on the Air Staff, stationed in the Pentagon on 9/11. By sheer luck, we had had a "dry run" evacuation of the Pentagon about five weeks earlier. A fire broke out in one of the kitchen areas, filling the building with smoke. The alarms went off, and the building was evacuated — but not smoothly at all. Many offices didn't have evacuation routes or marshalling areas, others didn't have recall rosters or procedures, and some evacuation doors were chained shut! Many of these problems were corrected over the next several weeks, to our great benefit during the 9/11 attack.

On 9/11, my office followed the events in New York City very closely. Although we were about one-third of the way around the Pentagon from the point of impact, we felt the entire building shudder heavily at the instant of the attack; we knew we were in a new kind of war. This time, the evacuation was very smooth, orderly, and quick. We were able to rapidly account for the 50 or so persons in our office, none of whom were casualties of the attack.

Did the attack have an impact on my career? Absolutely. While Sandia is truly a national security laboratory, my memories of that day have served to heighten the importance of our work in my mind. I remind myself of this daily.

### *Bill Rorke (8244)*

It was a gorgeous autumn morning just two weeks into my new assignment at the Pentagon. I was sitting at my desk on the A-Ring when suddenly there was a very loud "boom" outside my window. Turning to the person sitting next to me I said "That was a plane crash." I assumed somebody messed up big time either arriving or departing nearby Reagan National Airport. The office hummed onward without reaction for several more minutes, until suddenly the lieutenant colonel hung up his phone and announced in his command voice "Everybody out of the building. Now!"

Cell phones were jammed. I would drain my battery and connect only two short calls — one to my unsuspecting wife and one to Sandia: "I am alive and unhurt." I walked a couple miles, then hitchhiked halfway home. The car radio said the World Trade Center towers had fallen. I commented at how rumors can get out of control. My wife met me and we drove straight to the blood bank. It was closed, but soon there was a line around the block and they opened for donations. Only later would it become sadly apparent there was little need for blood.

The next morning, before anyone could exit the Metro at the station, a guard entered the train brandishing an assault rifle. I wondered about relevant CPRs [Corporate Policy Requirements] as I walked into the burning building. The building was to continue to burn for many more days. It stunk of JP-4 and burnt plastic. Originally, the Pentagon was partitioned by fire doors, but over the decades they had gradually been removed. Now all 17 miles of corridor were open and filled with fumes and soot.

At the memorial service a week after the attack, one of the generals quoted Psalms 118:24: "This is the day the Lord has made for us. Let us rejoice in it and be glad." Indeed.

### *Steve Hatch (241)*

I was on official loan from Sandia to the Pentagon, working in the Deputy Assistant Secretary of Defense Office of Nuclear Matters from May 2001 to July 2003. When the plane struck the pentagon on 9/11, I was sitting in 3C125, about a thousand feet from the point of impact on the other side of the building. We had been in a staff meeting when my boss got a call and switched on the TV. We then sat stunned for a while watching the twin towers burn. It is a testament to how big and stout the Pentagon is that I did not hear or feel anything when Flight 77 hit. Ironically, the first we knew of it was when CNN switched over to show smoke billowing from the building. Seconds later, alarms could be heard in the hallway and we figured it was time to leave. On our side of the building, the evacuation was orderly and there was no smell or sounds indicating the nearby carnage. Once outside, I decided that the best thing I could do was to leave the area, so I walked over to the Pentagon City Metro and took the Blue Line to Springfield, Va., where my wife picked me up. A vivid memory from the scene is of the hundreds of people standing up on the I-395 expressway embankment all talking on their cell phones!

While being at the Pentagon on 9/11 would never be a distinction I would choose, I can tell you I would never have missed going to work on Wednesday, Sept. 12! I was proud to be part of Secretary of Defense Donald Rumsfeld's "show of resolve" by returning to work that day like normal. It was anything but normal, however, as I stood at the A-Ring window at lunchtime and watched the firefighters work on the roof across the courtyard. Rather, it was surreal to be at work in a building still on fire and containing bodies yet to be recovered. My family and I returned to Albuquerque in July 2003, having survived the D.C. snipers, the anthrax scare, as well as 9/11.

# 'You will immediately excuse all of the guests in the museum'

## *9/11 put National Museum of Nuclear Science & History on new trajectory*

***By Jim Walther, museum director***

"Jim Walther, please report to the museum lobby." That was the announcement that came over the public address system of the National Atomic Museum on the morning of Sept. 11, 2001. It was just before noon and we were all in shock, some in tears as we witnessed, with so many of our fellow citizens, the two towers collapse in a huge cloud of smoke and debris. I just lost it, right then. I was certain that each tower still held tens of thousands of New Yorkers unable to reach the ground. It was too much, and I was in complete shock.

The announcement was made by a museum volunteer, and when I made it to the lobby, four uniformed Kirtland Air Force Base security personnel were there waiting for me.

"Mr. Walther?" one asked. I replied, "Yes, I am Jim Walther, the museum director."

"You will immediately excuse all of the guests in the museum; we are here to escort each from the installation," he said.

Wow. And so it began. We cleared the museum, then that afternoon, we were all asked to go home. At that time, some of the museum staff were Sandia employees and some worked for the museum foundation. The foundation folks were not allowed to come back to work even after a few days. When I inquired as to when we would be permitted to reopen, I was told by the base commander, "You will not likely ever reopen here on base".


A VINTAGE AIR FORCE B-52 being dismantled for transportation to the museum's new location on Eubank Boulevard.

So we all met to make a plan to reopen outside the gate. The store manager and I went to Winrock Mall to ask if they would rent us a kiosk-type cart so we could keep some cash flowing and our name out in the public. If I could not get a certain cash generation going, people would be laid off. Winrock, amazingly, said they had no carts but would give a small storefront for the same price. We jumped on it and so began a three-day transfer, using Sandians inside and foundation staff at the mall, moving the entire museum store to the mall. We opened the "UP-N-Atom" store five days later. Since Christmas was coming, we had great success.

By October, I was looking at how to move the museum itself; I talked to DOE, reminding officials there of the federal law behind the museum and its important public education mission. I let Sen. Pete Domenici's staff know of our plight and I called my old friend Ed Able, CEO of the American Association of Museums.

Eight months later, on May 11, 2002, we had completed the transfer. We moved truckloads of historic nuclear weapons casings right down Central Avenue early every morning, aiming to be off the road by 6 a.m. We opened the museum in temporary quarters in Old Town and began our long campaign to find a final, permanent home for the museum.

It was hard to believe that way out in New Mexico, a museum would be so profoundly affected by the events of 9/11. The date is thus knitted deeply into the history of the National Museum of Nuclear Science & History as the date that put us into gear. Even as we remember those who lost and gave their lives that day, and think of the ways our nation has been changed, I think of how it affected the museum.

# California site rises to challenges of post-9/11 world

RADIATION DETECTION technologies, long a notable Sandia capability, have found new applications in the post-9/11 era.

*(Continued from page 3)*

of facilities across the nation, done principally out of Dept. 1500. There was analysis of nuclear reactors and determining what happens if a 747 impacts another reactor. One study was about spent fuel.

**Carolyn Pura:** The Haystack study suddenly went from a fairly interesting academic study to something everyone was interested in. We probably got three dozen phone calls over the next six months asking for briefings of that work. It wasn't long after that that we started into the Borders Grand Challenge because we wanted to look seriously into movement of materials and goods across borders.

**Duane Lindner:** One question that came up immediately was, had these planes been loaded with chemical warfare agents or biological agents, would we have been able to detect them? There was an immediate desire to do tests to see if some of the detectors we were working on could detect chemical agents in the midst of a cloud of pulverized concrete.

The other part of the Laboratory's history and competency in radiation detection was around the rapid response teams that we have responsibility for, along with other laboratories. Those programs have been in place for decades, and it's a capability that's been quite exquisite.

**Carolyn Pura:** That was already a well-developed capability. In particular, we had worked on the IND [improvised nuclear device] threat for many years prior to 9/11. The capability was in place; we were now responding to significantly increased interest in it. What was relatively new was the "dirty bomb" concept, which was considered a much larger threat.


LESS THAN TWO YEARS after 9/11, Sandia spearheaded a program known as PROACT, or Protective and Responsive Options for Airport Counter-Terrorism. Here, Sandia's Duane Lindner (8120) speaks at a 2003 press conference at San Francisco International Airport. Sandia worked with SFO on developing a detection system that could warn of the release of chemical or biological agents inside SFO's terminals.

*LN: Were new projects started in reaction to 9/11?*

**Duane Lindner:** Around Sept. 11, 2001, we were looking at the beginning of FY2002 and were facing huge budget cuts to biodefense. That changed. A lot of additional money came flowing in. We saw a big ramp-up of funding directed at measures to detect and mitigate bio-agent events.

Then things really started to happen. Congress began to appropriate additional funds. The PROTECT system, for instance, was in operation in one subway system in Washington, D.C., and Congress appropriated $80 million [following 9/11] to fully deploy that throughout the Metro system. We got heavily involved in that deployment and in others around the country.

**Rick Stulen:** It did accelerate our hiring of the biology contingent here.

**Duane Lindner:** Then we saw an acceleration of other parts. There was growing concern, for example, about things like rapid medical diagnostics and presymptomatic medical diagnostics, which have turned into a significant endeavor at Sandia.

**Rick Stulen:** I think another sort of meta-theme was coming into play. We began, as a national laboratory, to work with a different constituency. Instead of just NNSA, DoD, etc., we realized that we needed to work with local entities: health officers, local fire departments, facility managers, the first responder community. I am hard-pressed to remember — in the 1980s or 1990s — much significant engagement with those constituents.

**Carolyn Pura:** On the rad/nuc side, as DHS was beginning to stand up, it became clear that there were threats around particular venues at key events. The first one was, I believe, in December 2003, a few days before New Year's Eve. It suddenly occurred to them to look at Times Square, at the international focus happening there, as a prime opportunity for a terrorist.

I remember getting the phone call when I was at a play in San Francisco saying we need you to tell us how to use our detection assets. In a 24-hour, around-the-clock effort, we put together a report saying this is how you should deploy your assets and this is what you'll be able to see and what you won't be able to see.

***LN:** Do you feel we were successful in influencing the government in the early days of homeland security? If not, what went wrong?*

**Mim John:** Our biggest influence came from committing some good people early in the process. (Now-retired) John Vitko had a lot of credibility in the biology community and was put in charge of the biology program for DHS S&T. (Now-retired) John Cummings was a natural fit for the infrastructure protection program.

After about a year into standing up DHS, however, support for the labs as a key provider of S&T solutions began to erode. There was huge political pressure to open up the aperture to the private sector and focus on short-term solutions. With subsequent leadership changes in the S&T organization at DHS, there was a view that the federal labs, not just weapons labs, were just another contractor. It became a tougher environment to grow the program and create opportunities.

**Rick Stulen:** The leadership was made up of folks from many other places in the government, so there wasn't the level of understanding to really sort through it all.

**Carolyn Pura:** The need for upfront R&D wasn't recognized as something necessary to getting the job done right. There was a desire to skip over R&D to get products out right away. But in many areas, the technology wasn't mature enough.

*LN: Why did you feel it was critical to have a Homeland Security SMU at Sandia?*

**Mim John:** I felt we had to make a very clear statement to everyone, especially our sponsors in Washington, that we were fully committed to this mission. Keeping it tucked away behind WFO for the military or our work in intelligence would have sent the wrong message.

MICROCHEMLAB, developed in the 1990s and early 2000s at Sandia, is a portable, handheld chemical and biological analysis system that combines sample handling, separation, and detection. The result of a decade of work, the technology demonstrates Sandia's ability to innovate by integrating capabilities including microsystems, chemistry, biology, and systems engineering.

A number of people were hesitant because they feared homeland security would be nothing more than a passing fancy. That was put aside when DHS was stood up as a federal entity.

On 9/11, I was with an Army group on Cape Cod. I stepped out of our meeting and a staff assistant told me what was happening. One of my first thoughts was that the world had changed and that Sandia suddenly had a new mission. Why did I think that? We'd been working on the chem/bio problem and unconventional nuclear threats for a long time. The attack didn't surprise me — the method did — but it didn't surprise me that someone had finally succeeded in attacking the US. Over the next few years, those of us who believed in the importance of the mission for the lab refined these initial thoughts into arguments for a new business unit.

*LN: How did 9/11 and the anthrax attacks impact staffing?*

**Mim John:** Once we committed to building a biodefense program, we had to get deeper into bioscience. It was hand and glove. We gradually grew our bioscience expertise to have credibility in the biodefense mission.

**Duane Lindner:** We got started building detectors, which requires an understanding of biology, but not at a deep level. There was a realization early on that this was an incomplete solution if we wanted to grow our program. Without true biologists, people with advanced degrees in virology and immunology, for example, there were parts of the problem space we couldn't touch.

**Rick Stulen:** We also hired in rad/nuc to meet these new needs. We hired physicists to work on antineutrino technology, people I don't think we would have hired otherwise. That capability strengthens our core set of capabilities in nuclear weapons.

*LN: What are our most significant achievements since 9/11?*

**Duane Lindner:** The US now has an effective bio-warning response system in all major cities. Sandia had a significant role in that work and still does. That is a huge accomplishment.

We also have the ability for rapid decontamination. We have demonstrated that it works and we have plans and procedures. We have detection systems in major subway systems so that if an Aum Shinrikyo-like attack happened, we would detect it and respond.

Most US airports are now being hardened against attacks based on Sandia work. We had a large program, PROACT [Protective and Responsive Options for Airport Counter-Terrorism], directed at detection of the release of bio agents in airports, which led to a set of guidelines that the Transportation Security Administration issued. Susanna Gordon (8958) led this effort as well as PROTECT. None of these accomplishments are singularly Sandia's. In this zone, we work in collaboration with other labs and other organizations.

**Carolyn Pura:** In the rad/nuc area, a major accomplishment is our ability to screen cargo. We can also look at any major venue and quickly analyze the right way to protect it.

**Rick Stulen:** Another success is how we've evolved as a laboratory. I think we've really strengthened our systems analysis capability. You see this play out all over the place; NISAC [the National Infrastructure Simulation and Analysis Center] is an example.

***LN:** Are there any enduring lessons we've learned post-9/11?*

**Mim John:** There are lessons to be learned from standing up the Homeland Security SMU. I have observed a common theme, not just at Sandia, that leadership believes its job is done once the decision is made to establish a new business line, but leadership typically fails to understand what it will really take to grow it and succeed. If you are serious about getting into a new business line, recognize that you've got to invest some money and that the new kids will not be able to carry their weight for a while. That's not to say you don't still set goals and hold the new business accountable for providing return on investment.

The new SMU had some LDRD funds, which were critical, and we were beneficiaries of some large Grand Challenge investments, but we were also saddled with high corporate taxes and were on our own to run the SMU with the same level of corporate analysis and reporting that other SMUs had. That was a heavy burden for a small SMU. Much more careful business analysis would have helped tremendously. It's common sense in retrospect, but in the moment we were just trying to make something happen.

**Rick Stulen:** The way we used our LDRD resources to position the Laboratory in biology is a very strong and positive lesson learned. We never could have gotten where we are today without deploying those resources as we did.

I think we underestimated dramatically how difficult it would be to interact with a new agency. We also underestimated how long it takes to stand up a new organization — it's still happening today.

We're in a similar position to where we were before 9/11 in regards to cyber. There has not been a 9/11-like cyber attack, per se, although there have been multiple hits. Many entities in the country have a piece of it [cybersecurity], but there's no one central authority. What's the role of the laboratories? Are we at the tipping point for cyber? We're starting to build up the capabilities, we're hiring people. It's closely aligned with our computer science capabilities.

# Responding to the needs of our time

## A Q&A with Div. 6000 VP Jill Hruby, head of Sandia's International, Homeland, and Nuclear Security SMU

*Ten years ago, Jill Hruby was a senior manager in Microsystems and Engineering Sciences. She went on to become director before being asked to take the helm of homeland security programs as director of a new organization established to support the Labs' contributions to national security challenges that emerged following the 9/11 attacks. Now, as VP of the International, Homeland, and Nuclear Security Strategic Management Unit, Jill oversees many programs dedicated to homeland security and a range of national security objectives. She sat down recently with* Lab News *writer Renee Deger to discuss how Sandia has evolved as a result of demands following the attacks.*

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***Lab News:*** *What were the immediate demands you faced in the days, weeks, and months after the 9/11 attacks?*

**Jill Hruby:** My world didn't really change relative to 9/11 until [then-Div. 8000 VP] Mim John asked me to take the Homeland Security director's job in 2005. When I started working on homeland security, it was really focused on counter-WMD [weapons of mass destruction], in particular bio and nuclear, and also on infrastructure protection because the National Infrastructure Simulation and Analysis Center (NISAC) had been established. There were many other smaller efforts under way, but the bulk of our program was in these areas.

JILL HRUBY

***LN:*** *How did the kinds of projects that you were working on change as a result of the attacks?*

**JH:** At the Laboratory we have kept a steady focus on counter-WMD; we have to deal with the really high-consequence, if low-probability, events because if not us, there's nobody else to do it. And we've never shifted; we never took our eyes off that need. We have to be the nation's brain trust for countering WMD.

That being said, we have changed our work portfolio in a few respects. For example, one thing that really changed while I was the director of Homeland Security Programs was the amount and type of work we did on explosives because there were these multiple events associated with explosives, particularly on airplanes. Also our work in emergency response increased considerably due to large events, especially Hurricane Katrina. Emergency response was, and continues to be, a shifting landscape in terms of priorities and new concepts for preparedness. We now explore answers to tough questions about how to accomplish an effective response to incidents of enormous scale, how to most effectively conduct exercises, and what Sandia can bring to the table. Our NISAC organization and others become real-time consequence analysis and response organizations as needed.

***LN:*** *What did it mean to begin working with a broader range and type of agency beyond your traditional DOE/DoD clients?*

**JH:** There are some things that are unique about the Department of Homeland Security (DHS) that took us a little while to figure out. One is that it is essentially a law enforcement agency and whatever you develop has to be useful to the people in the field. And it means the technology has to work within a concept of operations that's completely different from the military. You have to understand how each technology is going to be used, and how the public is going to perceive it. Being aware of issues of privacy, freedom, all the things that have to be protected in terms of the US population, was a whole new dynamic. Working with threats and vulnerabilities without clear classification guidance was also challenging. But mostly, the largest cultural shift for us was to provide quick solutions even if they weren't perfect. DHS and Congress were determined to increase the levels of protection for US citizens as quickly as possible and if we were to help we needed to get both ideas and solutions out of the Lab in unprecedented time frames.

And the harsh reality at DHS around 2005 was that this was going to take a long time to get right. DHS was created by combining 22 existing agencies, and they all had their own cultures. They all had their own way of doing business. They all had their own operational units, and in some cases they had their own S&T [science and technology] organization or suppliers. They weren't a unified organization. Each office I visited required a unique set of paperwork to get a badge, and each office had a different badge because DHS didn't even have a common security system. It wasn't like you were working with one agency, it was like you were working with 12 or 15 components, each of which was their own entity.

There was a lot of enthusiasm at the Lab to help the nation with this mission. It seemed liked the Labs were going to be important contributors to homeland security. We had a bunch of great work going on that we were able to pretty quickly take to field implementation, and then as we began to develop the next generation of ideas the reality hit that the department wasn't really prepared to invest in research and development. This was a big new organization with shifting and evolving priorities, and there weren't many people there who understood the capabilities or culture of the DOE labs. Industry was their supplier base, and their acquisition processes were being developed in real time.

And we realized we had a whole bunch of stuff to learn ourselves before we could really be useful. People at Sandia wanted to jump in and help, but started to understand, "Wow, this is really hard." At Sandia, everybody wants to do everything perfectly and DHS just wanted solutions "right now" that would buy down risk even if they weren't perfect. With no plan, by the way, to make them perfect, which was really hard for us to get our heads around. First, we were excited because we could really help, and we did some fantastic things. Then we came to a realization that they needed solutions that were cheap, flexible, fast, and could be used for multiple purposes. The requirements were often unrealistic and not formalized, and the department personnel were also still learning, Congress was exercising significant oversight, and the threats were ever-changing; this wasn't our usual research and development environment.

We started learning and were beginning to chart a long-term path when Hurricane Katrina happened, and DHS went through a real low in terms of morale within the organization and the confidence of Congress. There was also a complete reset of the scope and priorities for the department. Secretary Michael Chertoff continued to talk about risk-based approaches but Congress wanted improvements to specific security issues, regardless of their likely contribution to risk. This dynamic persists to this day, and our folks involved in this mission have had to adjust to this kind of political environment.

***LN:*** *Did you feel a renewed sense of mission or urgency in your work?*

**JH:** Yes, there is no question about that. I think everybody at the Labs knew that something fundamentally had changed with respect to national security. Many had thought about these possible new threats, many had not. The Cold War had been over for quite a while. We all understood that nuclear weapons and the value of nuclear deterrence would be around for a long time even though the military strategy had shifted. We had already moved into new areas, but 9/11 increased the breadth of national security challenges and, in a way, gave us permission to think about how to bring our capabilities to a broader set of concerns.

I know others could speak to this better than me but I think it also changed our sense of what we needed to do for the DoD. It wasn't just that DHS was stood up, but DoD started thinking about new missions as well, and they started thinking about the weapons that might be used against their troops and how to protect them. Our work in what's now IHNS around protecting nuclear weapons at bases got significantly more attention.

You know prior to 2001, the way we talked about ourselves, we were either a nuclear weapons laboratory or a multiprogram laboratory. After, we really started talking about being a national security laboratory, and with a much better sense about what that meant.

***LN:*** *Did the events validate any fledgling ideas or projects that had failed to get any traction before?*

**JH:** There's no question that biology became more mainstream and more focused. Biology was growing in importance and we were getting involved in different ways, but it meant a lot of things. After 9/11 and the anthrax event, the idea of biothreats and the need to understand those threats and systems that would detect them or help us respond to them and clean up after them became much more a part of our mainstream mission. There's no doubt that biology was a little bit fledgling and this gave a lot of focus to it. Biology really has two focus areas for Sandia, both natural and man-made biological threats to public health as well as biological organisms and processes as a source of energy.

Also, critical infrastructure protection was in the right place. This is an amazing thing about Sandia, but a group of people had previously decided critical infrastructure was going to be important and there's no question that that became solidified. We had gotten support from the New Mexico congressional delegation for critical infrastructure analysis and it had been funded about that same time. When DHS was established, NISAC was moved to DHS and it quickly became a core program that continues in its importance to the resilience of the mission.

And we had always had radiation detection for response missions and for NNSA, but the idea of radiation detection in the private sector — at ports, at borders, and so forth — became much more important to DOE, DHS, DoD, and the White House.

Cyber was becoming a big issue as well. Somewhere in the time frame not too long after 9/11 cyber became much more a part of what we talked about at the Labs. I don't know if it was related to 9/11 or not. Maybe it emerged from the creative process that had begun. We started thinking more, much more, proactively about what bad things could happen to us.

Explosives, too, as I said earlier [became an area of increased interest]. I think our work in explosive effects, explosive formulation, and explosive render safe grew in importance. This area grew after we figured out terrorists were not necessarily going to use military explosives but might formulate new homemade explosives. Our work in explosives expanded beyond military explosives to nontraditional explosives, liquid explosives, and others somewhere in that time frame as well.

***LN:*** *Ten years later, where do you see the biggest difference at Sandia?*

**JH:** Our identity as a national security lab is pretty firm. Today, the idea that your career at Sandia might include nuclear weapons or homeland security or defense systems or combinations of all of these is a change. It's now the expectation that you could, in the course of your career, work in all or any of these areas and still be equally a part of Sandia National Labs. We now support lots of government agencies on national security issues and that's a fundamental change.

***LN:*** *Are there any questions that you'd want to weigh in on that I didn't ask you?*

**JH:** I feel we're on the brink of another big change. Not that I expect it to be necessarily driven by an event or that I have a feeling that doomsday is around the corner. Maybe it's the economy. But I have a sense that what the Lab is, its place in overall national security, is a work in progress. So we did what we needed to do to help the nation and now we step back and say, "OK, Sandia is something different." Our place in the enterprise is going to continue to evolve. We know we have a lot of work to do in the nuclear weapons program over a pretty long period of time but what else? My sense is that one of the things that have fundamentally changed is the evolution of the Labs and it's going to continue.

What has happened out of all of this is that Sandia has emerged as a very strong, very capable laboratory with diverse domain expertise, incredible capabilities, and much more agility. And we're just getting a sense that our job is not just about going to customers and finding out what they need and doing it; but actually projecting the future, influencing the future, and informing the discussions about the future.

I don't think we're anywhere close to being as much of a national resource as we could be. But I think we have made great strides in responding to the needs of our time and I look forward to tackling the challenges of this new model so that we realize our full potential.

## Remote computing capabilities revamped since 9/11

When Sandians were sent home on 9/11, "We found that we did not have capabilities we would need in case of a prolonged restriction from the Air Force base," recalls John Zepper, director of Computing & Network Services (9300). "At the time of 9/11, we had 138 modem dialup ports. This meant that the demand from home far exceeded our capability. We immediately began implementing our Virtual Private Network to allow much more capacity. Our first VPN allowed for 500 remote users. We now have capacity for 750 users with the ability to easily expand if needed."

There are currently 5,500 VPN accounts, with an additional 4,000 accounts able to use Juniper's remote desktop capabilities, says senior manager Carol Jones (9310). During an average week, more than 1,000 users remotely access Sandia through the Juniper system. During a normal day, at any one time there is an average of 200 users, well below Sandia's current capacity of 750 users.

"By the time the bird flu pandemic came, we were well-positioned," says Carol.

Says Mike Cahoon (9310), "If we had to stay home, we now can quickly add additional capacity."

A tiering process was put in place to prioritize corporate applications. Also, Sandia/California now serves as an alternative site for data recovery, with Sandia-NM's basic IT infrastructure duplicated there. Disaster-recovery software for continuity and recovery plans are also in place.

"In addition, we have just finished a Business Impact Analysis (BIA) for Sandia/California and will start to work on reciprocal disaster recovery services in New Mexico next year," says Carol.

And, she says, "From a cybersecurity perspective, we implemented greater firewall controls to limit the ports and protocols able to enter and exit our networks."

# Sandia's idea factory

## *Labs' Advanced Concepts Group conceptualized alternative approaches to addressing terrorist threats*

***By Neal Singer***

Sandia's Advanced Concepts Group (ACG), a technical "think tank" formed in 1999 to scope out long-range national and global security problems that Sandia might help solve, found an immediate focus for its concerns with the events of 9/11.

But, says Gerry Yonas, now retired VP, principal scientist, and ACG director, the group's concerns with what it termed "ultraterrorism" predated the fatal air crashes.

GERRY YONAS

"One of our problem areas from the get-go was 'ultraterrorism through asymmetric warfare' [UTAW]. It proved pretty close to what happened overall," says Gerry. "We held several workshops before 9/11 on UTAW. People like Jim Woolsey [former CIA director] and [noted terrorism expert] Steve Emerson were involved in helping us identify threats to the nation. We predicted we would turn against ourselves, using guards, guns, and gates, and we would spy on ourselves electronically. In our predictions, we were pretty well ahead of our time."

Tommy Woodall (now 0430), Dennis Engi (retired), and Gerry went to Washington during both the Clinton and Bush administrations to interest government leaders in facing what they saw as an oncoming threat. "But at the time, leaders believed they had other fish to fry," says Gerry.

Says Tommy, "The problem was, people just didn't believe it could happen here. Until it happened, it was hard to imagine it.

"Our experience was that for the most part, the more senior the people, the less they could see that the openness of our society could be used against us. And it wasn't just them. Probably 99 percent of the people in the country just didn't think it could happen here. Try to imagine anything as wild and spectacular, in a bad way, as we experienced on 9/11, before it happened. Some leaders 'got it' early but we didn't have a critical mass soon enough. Among the issues we wanted leaders to consider was how to make our society more robust and resilient so we could keep an open society after a terrorist attack; also, how we could persuade people who might attack us, not to do that."

Gerry says he blamed himself for "not being aggressive enough to warn people about what we thought was going to happen." As ACG director, he felt that part of Sandia's job was to provide the technology and insights to head off such events, and he set the group to work to come up with a Labs wide strategic approach to thwart terrorist intents.

### The fire metaphor: terrorism as a manageable threat

One immediate response was the so-called fire metaphor, developed with former ACG member John Whitley (now 2916), that offered a useful mental approach to the emotional event of 9/11. The paper, written by John, compared the danger of terrorism in 2001 to the danger posed by fire 100 years earlier.

The fire paper's analysis pointed out that at the end of the 19th century, people rightfully dreaded fire. It killed people and destroyed homes, businesses, and neighborhoods. But by making investments in technology — fire alarms, hoses, extinguishers, heat detection sensors, water sprinkler systems, firehouses with advanced communication systems, and social tools like fire codes and fire insurance — the threat became manageable.

"The metaphor helped by letting people get mental arms around an analogous case during the national turmoil that existed immediately post-9/11," says John. "Because it was calming, not crisis-driven, it was hard for the idea to gain traction with policymakers. But Gerry talked about it everywhere, and it helped people see how society might accept some infringements on personal liberties to deal with terrorism, much as society accepted some in dealing with fire."

Says Curtis Johnson (5635), another former ACGer, "I think the world is playing out like the metaphor suggested. We haven't been able to eliminate terrorism, but we know a lot about minimizing and managing its influence so that people can go on with their lives." He mentions the airport imaging capability of the Department of Homeland Security, its control of liquids on planes, and the addition of bollards so that a vehicle can't accelerate into a critical building.

"We deal with the danger of fire all the time, but we don't overreact," says Gerry. "We wanted to create a similar mindset about terrorism. Osama bin Laden had said that what would cause the downfall of the United States wasn't terrorism itself but US overreaction, which would bankrupt its economy. We wanted moderation in response."

### The people at the end of the wires

Another issue taken up by the ACG was to better understand the flow of people and goods across the border. Statistics from 1999 demonstrated the size of the problem. In that year, the United States was entered by 475 million people, 125 million vehicles, and 5 million maritime 40-foot containers. Meanwhile, 2.7 million undocumented immigrants were believed to enter the United States yearly. Total annual US cocaine consumption could have fit in 15 40-foot containers.

The ACG perceived the problem as a zone, rather than a border, and took the position that security started with worldwide systems that could track the flow of goods, with cooperation from friendly countries. A ship that took a strangely long time to complete a voyage, or stopped at a port nonessential to its route, could be a warning flag. "This definitely fits to a tee the 'safe, secure borders' theme that is of current interest to Sandia," says Curtis. "We're dealing with analogous issues in similar ways in cybersecurity."

One approach that did not take root was a concept called FACETS — a "fractal approach for clarifying and enabling timely support." Meant to overcome the frustrating lack of communication between different levels of law enforcement organizations that might have prevented the hijackers from boarding the planes they victimized, the program proposed a fractal architecture that would allow groups large and small to store information in a format that permitted easy sharing through automated Net components throughout the integrated system.

"The problem with the info networks was not the wiring, it was the people at the end of the wires," Gerry notes. The idea behind FACETS was to make information flow more easily so that professional insularity would cease to be a problem.

"I haven't seen anything come of FACETS, though it was a good idea," says Curtis. "But there is growing academic interest expressed in conferences and working groups, in rapid spontaneous organization — self-organization, in effect — for everything from emergency response, to the next Cairo."

### Understanding the social dimension

Studies were made under the umbrella of DICTUM (dynamic, integrated capability for threat understanding and management) that could predict radicalization if certain social components were present. "DICTUM did not catch on," in Gerry's opinion. Still, clearly there has been national security movement in this direction. DICTUM's intent was to integrate sociology, group theory, biology, and biosciences, as well as gang theory and the effects of racism, to establish behavioral norms in foreign countries. A massive database to analyze phone call connections, meetings, travel patterns, and banking transactions among suspected members of terrorist networks, using software tools for pattern recognition to track suspicious behavior, were discussed.

"DICTUM was dying by the time I got to the ACG, but obviously I took a similar road," says Curtis. "We are continuing to understand the social dimension." Sandia's augmented cognition program, he says, traces its inception to ACG, and Curtis' current social analysis work was born and funded there.

Gerry was happier with the result of the ACG's RSTAKA (Reconnaissance Surveillance Target Acquisition Kill and Assessment) program. "We emphasized it for insurgency warfighting," he says, "and that is fairly well-accepted with the predator unmanned aerial vehicle." But he says he is disappointed in the "lack of focus on sensor networks to detect and destroy hard-to-find targets, and that is still needed for IEDs in Afghanistan."

The group also considered ways to aid intelligence analysts, decision makers, and soldiers through better understanding of brain function. The focus on understanding how the enemy thinks guided Gerry into neuroscience research at the Mind Research Network, based in Albuquerque, and most recently, into a keen interest in the wellbeing of returning troops. He hopes Sandia takes seriously enough the problems that face returning servicemen and -women. "Former service people kill themselves every day," he says, referring to information released by several armed forces magazines.

### National security problems are often 'people problems'

Gerry's intense concern for humanity, sometimes masked by his sense of humor, is one reason the ACG was ahead of its time in understanding that national security problems are often "people problems," and technology is only one element to their solutions, says Curtis.

"Gerry was advocating a focus on general populations when the DoD was still very much committed to 'shock and awe,'" he says. "I think Gerry and the ACG made important contributions to turning the DoD ship toward an approach that appropriately balances addressing current security threats with finding ways to encourage general populations not to provide the support insurgents and terrorists need. Convincing the adversary to quit or surrender is almost always more desirable than extended fighting.

"The Arab Spring is perhaps the best example so far of how important ordinary populations and social movements are in today's national security environment."

To Gerry, the other most important component of the ACG was its determination of what it called "geezer threat"


US CUSTOMS AND BORDER PROTECTION port of entry.

— the aging of Western Europe and Japan's population— with the resultant, possibly crippling strain on the economies of countries whose smaller younger population must support a large retired population.

Such a situation in the US would play into the late bin Laden's ideas of wrecking the US economy by combining the expense of a continual mobilization of a war against terrorism with declining revenues to pay for it. Against this, Gerry says, is the continued immigration into the US of younger people, and the efforts by groups like the ACG to use technology to keep seniors productive rather than on social security. Online "grandparents" could comfort and educate the children of working couples after school. They could be online teachers and also monitor computers from home. The ACG envisioned jitney buses continually available in senior centers to transport the willing to jobs, and mental stimulation both conventional and through electronic wiring to keep aging brains primed and alive.

All the ACG's top objectives, in fact, became aimed in part to aid the war on terror: to deter adversaries from developing nuclear weapons; dissuade populations from providing direct and tacit support to terrorist and insurgent groups; and encourage governments and populations to build stronger societies and economies.

Mixed in with these objectives were support for development of hardware and sensors for distribution where they would be useful.

The ACG was closed in 2007, according to its dynamic office manager Alicia Cloer (now 10685), and some of its functions were assumed by other organizations.

# Sandia voices: Remembering 9/11

### *Diane Mendiola (1522)*

On Sept. 11, 2001, I was working as an administrative assistant for Mercer HR Consulting in Stamford, Conn. I'd started the day with my typical long commute from Monroe, N.Y., over the Tappan Zee Bridge, and up the congested Interstate 95 corridor. I still recall what a beautiful morning it was, and how quickly everything changed. My boss emerged from her office with the first report that a "commuter plane" had hit the World Trade Center. Immediately, I thought of James, one of our consultants, who was en route to a meeting at the WTC at that very moment. Thankfully, I was able to contact James and warn him of the danger.


DIANE MENDIOLA

Tragically, not all of our colleagues returned home safely that day. Mercer's parent company, Marsh & McLennan, had offices in the twin towers, and 295 employees lost their lives in the attacks. (A tribute to them can be found at http://memorial.mmc.com).

### *Brian Nelson (6523)*

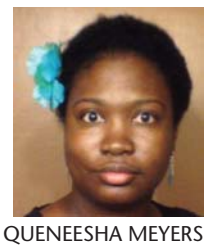
As it did for so many other Americans, 9/11 changed my perspective on life. I was a young 20-year-old geek, just starting my second year of undergraduate education — with a brand new job at Sandia, the most coveted place to intern in all of New Mexico. Like most young college students, I was contemplating future career options, having fun with friends, and deepening a relationship with my future bride. I was finally within grasp of the perfect life — happily married with 2.5 kids, a steady job, a dog, and a white picket fence to surround it all. Ahh . . . I was ready to enjoy my slice of Americana!


BRIAN NELSON

But, then the twin towers came crashing down, the Pentagon — the very symbol of our military might — was smashed and damaged, and a plane exploded in the fields of Pennsylvania. Many Americans lost their lives — may their souls rest in the presence of God forever. And now, the American way of life was in jeopardy. And yet, Americans everywhere stood up to face the challenge. My colleagues, my mentors at Sandia, eagerly pursued every opportunity to contribute to every need in the face of the enemy. Some worked late hours to ensure fully functional computing equipment in support of other Sandians, others sifted through the rubble at Ground Zero. All were focused, and all contributed fully according to the talents that they had. In the midst of this tragedy, a new generation of Sandians was given a very real lesson about the fight for freedom. Now, 10 years later, Sandians everywhere continue working with the highest level of commitment to national security — it's an honor to call them colleagues. Life has continued on, and I now enjoy my slice of Americana — albeit with a fervor to ensure the protection of this way of life for all Americans.

### *Queneesha Meyers (4232)*

I was born and raised in Brooklyn, N.Y. My high school was located in Manhattan so I took the train over the bridge and would see the towers of the World Trade Center every day. At the bottom of one of them was a shopping area. On days we got out of school early, we would go hang out and window shop.


QUENEESHA MEYERS

On 9/11, my husband and I were stationed at Robins Air Force Base in Georgia. That day, I went in to work later than usual. My husband got orders to Kirtland AFB and my reserve unit was throwing a going-away party for me. I was listening to the radio ,driving to the gate, when the program was interrupted with an announcement that a plane had hit one of the towers. I got to the gate, handed my ID card to the guard and told him about what I had just heard. The radio station was silent as I drove to my building. I rushed in to tell everyone what I heard. We had a TV in the main lobby area and all of us, including my commander, huddled around watching. And then we saw the other plane. We were all wondering why it was flying so close and then, BOOM, just like that, it hit the other tower.

My heart sank on the spot. It was pretty much a blur but the base was abuzz and so was our unit. We were called in to several meetings and briefings. All I could think about was my family in New York. It wasn't until I got home later that I found out my cousin, who worked in one of the towers, was safe. She was late for work that morning and was stuck on the train when everything took place. I've visited Ground Zero since then and it is such an emotional site to see. Whenever I look at pictures of the current New York skyline, it doesn't feel the same. Growing up I took for granted how blessed and fortunate I was to have been able to see, to be inside, and to experience the towers.

9/11 has forever changed me. I love my hometown now more than ever. Something that was set out to destroy and separate has brought us even closer. My heart goes out to all of the victims and their families of the tragedy on that day. I will never forget.

### *Peter Merkle (6831)*

On Sept. 11, 2001, I was working in the Defense Threat Reduction Agency (DTRA) Advanced Systems and Concepts Office at Ft. Belvoir, Va. I was assigned to the Pentagon and then DTRA, where my primary duties were leading and contributing to projects for interagency threat assessment, counterterrorism mission planning and training, and technical policy support in the chem/bio/nuclear threat space. Since March 1998, my work had focused on analysis of asymmetric threats posed by Al Qaeda, a threat not widely taken seriously.


PETER MERKLE

Once the alarm sounded on 9/11, we were evacuated to the basement of the DTRA headquarters. It was identified as a possible target for a plane still in the air, and we were able to evacuate home quickly. There was no way to contact Sandia to let them know I was OK, since all communications were down. We strongly suspected there would be multiple attack locations, and perhaps different types of attacks combined. In the days after the attack, we were very much occupied with policy support and briefings to leadership on the nature of the threat and possible next ones.

For the next several years, I continued working in the same areas in DTRA and at Sandia, focusing on technology for improving group decision-making under stress, red teaming, and infrastructure vulnerability assessments. It wasn't until 2007 that I moved completely away from that sort of work.

A friend of mine and relative by marriage, Andrew Fisher, died at the World Trade Center on 9/11; the wounds of that day will be a long time healing.

### *Anna Barr (9751)*

On Sept. 11, 2001, I woke up in my Pagosa Springs, Colo., timeshare, ready for a week of vacation. When I went into the living area, my trip companions were watching the coverage of the first airplane flying into the World Trade Center. As I stood there watching the horrific event, another plane flew into the second tower! I couldn't believe what I was seeing — someone had intentionally flown planes into the twin towers!


ANNA BARR

We went about our planned excursion for the day — a trip to Mesa Verde National Park. It is one of the most beautiful things I have ever seen in my city-born-and-bred existence — dwellings thousands of years old were set into sheer rock cliffs. It took my mind off the terrible news and focused me on the things humans do to preserve their livelihoods rather than what they do to destroy them.

When I returned home to my verbally abusive work environment, my boss began ranting immediately. I scribbled out a hand-written resignation, gave it to her, and walked out. As I drove away that day, I realized that life for me had changed forever. I was no longer going to put up with negativity and soul-sucking environments or people. I was only going to contribute my energies to organizations that celebrate life and encourage the human spirit. I drew a line in the sand on that day that has since made all my life decisions much easier, and led me down the path to Sandia National Laboratories. I love working in a place where the human spirit and all life is respected and encouraged to "exceptional service in the national interest."

### *Robert Virden (9535)*

On the morning of 9/11, I had just arrived in Boston Harbor on a brand new cruise ship. I had just completed a two-week trans-Atlantic crossing on the ship *Celebrity Summit*, on which I was installing an interactive TV system. Being brand new, the ship had no paying passengers, only craftsmen who had sailed with the ship from France to finish up the interior during the crossing. The crew was scheduled to fly out of Logan airport that morning back to France, and then the ship was then going to New York for a grand welcoming ceremony. Just as the Immigration and Naturalization Service and Customs officials were clearing the first of us for debarkation, their radios and cell phones started ringing. Without explanation, they closed their books, said "nobody gets off the ship," and then kicked us out of port.


ROBERT VIRDEN

I brought up our satellite feed and started broadcasting live footage over the ship's TV systems at that point, and we all watched in horror as events unfolded. Eventually, we ended up in the Bahamas for a couple weeks, as that was the only place that would allow us to dock.

9/11 had a direct impact on my career in that the cruise industry, and tourism in general, came to a screeching halt, so I was out of work for many months after that. Being unemployed for so long provided seven years' worth of motivation for me to go back to school, finish my bachelor's, get an MBA, and obtain professional certifications, without which I wouldn't be here at Sandia.

### *Chris Miller (10680)*

On my way into work the morning of 9/11, I remember the concerned and then frantic reports on the radio about the first and then second plane hitting the World Trade Center towers. As I approached the Wyoming Gate, the guard waved through every vehicle that had a Kirtland Air Force Base sticker on the windshield. Nobody stopped and there were no ID checks. I thought, "This is going to change."


CHRIS MILLER

When I reached the office in Media Relations, my first impulse was to turn on the radio and check the online news.

And then the Emergency Operations Center, located underground between Bldgs. 800 and 802, was activated. John German and I were the first of many in Media Relations who would spend countless hours in the EOC during the next couple of months. Sandia needed to ensure its facilities were secure and its people were safe from possible further terrorist attacks. An immediate task was to locate all Sandians on travel to ensure they were accounted for and safe, and were not among the casualties on the four crashed passenger airliners, at the World Trade Center, or in the Pentagon. A decision was made to release Sandians early. A release schedule was formulated and then sent to employees. Meanwhile, the hours passed in the EOC and finally late in the day, I went to an adjoining room and saw on television for the first time video showing the collapse of the twin towers. I was mesmerized and still incredulous of what I saw. Finally, around dinnertime, I exited from the EOC. It was the first I had seen daylight since about 8 a.m. that morning. Sandia was quiet. The parking lots were empty. As I headed home, my thoughts focused on my family. I wanted to hug my wife and three children and thank God they were OK.

*(Continued on next page)*


DENISE BLEAKLY (5944), WATERCOLOR, "The Ripples of 9/11", 2001. Says Denise: "I painted this watercolor right after 9/11. I had a sense that the fabric of humanity had somehow been shaken. Humanity is represented by the spectrum of colors, and the ripples of the paper represent this feeling that something moved through the continuity of humanity because of what happened on 9/11."(Photo by Randy

(Continued from preceding page)

### David Chacon (9329)

I can remember pulling up to work in the parking lot on the morning of 9/11and hearing breaking news on the radio of the first plane hitting the towers. By the time I walked into my office and found a TV, the second tower was hit.

DAVID CHACON

As we all stayed glued to our monitors trying to get in to any website where bandwidth hadn't been strained, it was frustrating not knowing what was going on in the rest of the country. I was trying hard to figure out if any of my military buddies or friends worked in those buildings. To this day, I'm not sure what exactly happened in our building, but I remember people leaving their offices to get off base before management had even declared it official to go home. Later as the other jets crashed, I knew then it would only be a matter of days before military retaliation would be used.

I remember grabbing lunch at the cafeteria and there were at most 20 people watching TV and eating. I went for a run that evening to clear my head and make sense of what had happened throughout the day. I was deeply saddened by the horrific loss of life and the thought of families that would be affected that one evening alone for a senseless act of terrorism. I spent most of the evening waiting to hear if any of my friends who worked at the Pentagon at the time had been hurt. They were all safe. I debated heavily on how to explain to my young daughter what just happened, and that yes, I would have to eventually leave.

In 2005, I had only been in Afghanistan for at most six or seven days when we had a memorial ceremony in Kabul marking 9/11. I was a very proud American soldier that day knowing that we were going to make it right. I was glad that I could look back someday and say, "I did my part."

### Rochelle Lari (3502)

I was at home sick in bed and my husband, Mohammad (Moe), had just dropped off my youngest son and his friend at school; he called to tell me to turn on the TV because one of the twin towers in New York had just been hit by a plane. I turned the TV on and saw the news about the Pentagon being hit. I told Moe that it was the Pentagon, not the twin towers. We found out soon enough that was both. My immediate thought was "Oh no, here we go . . ." Of course, I had concerns about attacks on US soil, but also concerns about my immediate family and the potential for attacks; my husband is a US immigrant from Iran and it seems that it's always, "Blame Iran and Iranians."

ROCHELLE LARI

What was really touching was that Mohammad's family called us from Iran the next day to express their heartfelt condolences to us and America about the attacks. They were so upset and deeply saddened about the attacks, the terrible loss of lives and also wanted to ensure that we were OK.

### Tan Thai (5630)

As my colleagues and I watched the events of 9/11 unfold, I remembered vaguely that someone suggested that we should pray. Several of us gathered in the conference room to pray. I do not recall any specific prayer; I only remember the feeling of helplessness and the earnest desire to call on God.

I left Sandia to pick up my youngest son, Stephen, who was six at the time. Major roads to his school were blocked because the FAA Control Center was right next to it. There was a long traffic line of anxious parents who wanted to see their kids; not panicky, just anxious. When I found Stephen, he was still playing with his friends.

TAN THAI

He asked me, "How come you're picking me up so early?"

"To take you home."

"Why?"

I did not know how to answer my boy. I did not know why people could fly the airplanes into the Twin Towers. I did not know why the country was under attack.

That night my oldest daughter, Hannah, 11, cried and said, "Everything will not be the same, right Dad?" Yes, Hannah, except God, everything else has changed since that fateful day.

War has come to our country and still stays with us. I escaped war from Vietnam only to find it again here. I am deeply grateful for the men and women in uniform who have been in war since that day to give us peace in this land. We must commit to do our part here at the Labs.

### Marie Miller (11500)

Sept. 11, 2001, that fretful day will be scarred in the memory of all Americans, the memory of lives lost and the brutal devastation inflicted on our great United States of America.

I couldn't believe what was on the news before I left for work. Was this really happening? At work, we were mesmerized by the news; no one said a word. We tried to work, but we were in a state of dismal disbelief, terror, confusion, and anger. We were sent home early.

Back home, I was glued to the television, sobbing at the devastation in New York and Washington. The only prayer I could say, "Oh Holy Lord, please help us!"

The next day, the EOC asked me to report to work. I was shocked when I arrived at Kirtland Air Force Base to see soldiers in combat gear with guns. They had me exit my car while they checked their list and thoroughly searched my car and personal belongings. Inside the gate, two soldiers in a tank pointed guns at me — ready to shoot. It was a rude awakening; my country was at war.

MARIE MILLER

9/11 brought us together — family, neighbors, strangers, nation. President Bush asked us to pray. He prayed that we be comforted by a "power greater than any of us." He cited a portion of Psalm 23, "Even though I walk through the valley of the shadow of death, I fear no evil for You are with me."

While writing, I couldn't believe how much the US has been affected by 9/11. That evil attack changed our nation forever. Finances, security, livelihood — its devastation continues. I hope we will remember 9/11, when frustrated at being scanned at airports, our economy on the brink, our many fallen soldiers. All this, and more, are a direct result of 9/11.

### Heather Clark (3601)

My husband and I were scheduled to fly out of Ronald Reagan Washington National Airport at about 10 a.m. on Sept. 11, 2001, after visiting friends. When the loudspeaker announced that all flights to New York City were delayed until noon, I remember thinking it was something innocuous like a computer glitch. When they were canceled, we turned to the television in the terminal and saw the first plane hit the World Trade Center and then the second. Then I looked down the terminal hallway at a businessman holding a briefcase staring slack-jawed out the window. I followed his gaze to see a big plume of dark gray smoke rising from the Pentagon. Eventually, the order was given to evacuate and that's when people panicked. I remember being swept up in a mob of screaming, frantic people racing down an escalator pushing anyone who got in their way. They said a car exploded just outside the airport.

HEATHER CLARK

Once outside, an inbound aircraft flew overhead and everyone fell to their knees, covering their heads with their arms. We stayed outside the airport for quite awhile because we had no place to go. In the early afternoon, we walked in the bright sunshine up a deserted curved highway ramp dragging suitcases as snipers on rooftops trained their rifles on us. Eventually, we found a hotel and three days later managed to rent a car to return to Albuquerque.

*"Now, 10 years later, Sandians everywhere continue working with the highest level of commitment to national security — it's an honor to call them colleagues."*

**Brian Nelson (6523)**

# 9/11 highlights need to secure infrastructure process control systems

**By Stephanie Holinka**

Sometimes it's hard to remember what the world felt like before 9/11. Just 18 months before, the nation's attention was focused on the Y2K bug. People wondered what would happen when the new year came and the date rolled to the year 2000. Would the banks shut down? Would the power grid black out? Would everything just stop?

As we now know, that didn't happen. But a lot of people thought about what could have happened, and about how it could have happened. While the country worried about Y2K, some researchers were worried about a much larger vulnerability that escaped the notice of most people.

After 9/11, suddenly all research into securing critical infrastructures was viewed with intense interest and worry. For example, it had become clear that all of our foundational infrastructures (electricity, oil and gas pipelines, transportation, water, telecommunications) are governed by comparatively simple supervisory control and data acquisition (SCADA) systems, which are also sometimes called process control systems (PCS). Left unsecure, they also provide an opportunity for nefarious agents to invade and sabotage some of the most basic systems that run our world. SCADAs collect sensor measurements and operational data, process and display collected data, and remotely control many system operations.

SCADAs originated in the 1960s using rudimentary analog devices and simple networks to assist with controlling infrastructures that were growing in complexity and were becoming too geographically dispersed to control and monitor manually. Most of these systems were unique and proprietary. Early SCADA networks were isolated in centralized architectures, with a single control center linking each island directly back to individual sites and plants.

In the 1990s, business needs coupled with the convergence of common operating systems and the rise of Internet technologies led to the interconnection of infrastructure control networks with corporate intranets at utilities. This opened up new risk. Many legacy SCADA components weren't designed to meet the bandwidth or processing requirements associated with modern cyber security technologies. Contemporary network technologies, software applications, and operating systems also introduced new vulnerabilities.

Juan Torres, manager of Energy Surety Engineering and Analysis Dept. 6111, previously the program lead for the Center for SCADA Security, says Sandia began work in the mid-1990s to help secure control systems for critical infrastructures such as the power grid and transportation.

In 1995, Sam Varnado (retired) met with colleague at the Pentagon, where they were discussing ways to take down an enemy's critical infrastructure such as their power grid. The military quickly realized that, if they could compromise an enemy's critical infrastructure, that enemy could do the same to the US. This clearly indicated that critical infrastructure protection would be an important national security problem in the future. With an eye toward this national need, Sam initiated a program at Sandia that would prepare the Labs to respond to this coming threat.

In 1998, President Clinton created the President's Commission on Critical Infrastructure Protection (PCCIP) to advise and assist the president in developing a national strategy for protecting and assuring critical infrastructures from physical and cyberthreats.

Under a contract with PCCIP, Sandia designed, organized, and helped run "prosperity games," which were tabletop scenarios intended to identify infrastructure vulnerabilities, both physical and cyber and to map strategies for mitigating these vulnerabilities.

The prosperity games helped researchers role-play responses to infrastructure attacks and disruptions such as those on power systems, which could then take down financial systems, and many other critical systems.

In 2001 and 2002, Sam worked on assignment in Washington to the deputy secretary of energy and led a DOE wide effort to define DOE's role in critical infrastructure protection. One result of this task force was the establishment of infrastructure cybersecurity programs and the formation of the National SCADA test bed in 2003.

From 1999-2000, Sandia conducted cyber assessments of the Strategic Petroleum Reserve, as well as major hydroelectric dams such as Hoover Dam and Grand Coulee Dam, environmentally important structures that also generate a huge amount of power.

In 2001, Juan's group also assessed the security of Singapore's Metro Rail Transit (SMRT) system. Shortly after an SMRT site visit, Singapore uncovered an al-Qaeda cell in their country, with plans to launch an attack on that very rail system.

"After 9/11, we started to understand that terrorists were recruiting computer scientists and engineers. We realized that the enemy was sophisticated and that SCADA systems could be targeted by terrorists through cyber attacks that could do physical damage, without having to be physically near the system," Juan says.

Juan adds that a significant challenge in SCADA security is that network technology evolves rapidly.

"Off-the-shelf networking products with the latest network technology are continually deployed into SCADA systems. Many are designed for corporate networks, and the standards to secure them frequently lag," Juan says.

Juan is leading researchers working on Energy Surety Microgrids™, an emerging element of the next-generation power grid, the so-called "smart grid." They are building energy surety — safety, security, reliability, sustainability, cost effectiveness — right into the microgrids.

Sandia's Department 5628, managed by Jennifer Depoy, continues to work with infrastructure owners and operators from a variety of industries, suggesting ways to plug SCADA vulnerabilities.

# Energy as national security: Sandia's role since 9/11

***By Stephanie Hobby***

Ten years ago, national security became household words as more US citizens had to rethink long-held beliefs about their meaning. As families and businesses hoisted flags across the country in a show of solidarity, private citizens started talking about measures ordinary people could take to make the nation safer.

"September 11 really refocused us on national security. What's emerged since then is a broader understanding of what that means," says Bob Hwang (8004), senior manager of basic research. "Sandia is a national security laboratory, and we're built on the heritage of our nuclear history. From that, we have developed a unique expertise in looking at national security in terms of surety, risk, and how one developed technology solutions to minimize risk and enhance security. From that there is a strong basis of engineering and science tools, expertise, and approaches to looking at security that one can borrow from our nuclear heritage and apply to energy."

Sandia's energy work predates those Tuesday morning attacks by decades, and changes in Sandia's energy research since 9/11 have been subtle. But the attacks and the following spikes in oil prices have shifted the attention of many Americans to increased energy research, and finding new ways to produce energy within the nation's borders was never more urgent.

### Transitioning transportation

Sandia's Energy, Climate, and Infrastructure Security Strategic Management Unit has identified seven national challenges, including reducing the nation's dependence on foreign oil, increasing the security of the nation's electric grid, understanding and mitigating climate change, and reducing the nation's carbon footprint. The link between the cars we drive and the dollars we send overseas for oil we use is well-understood, and the nation is eager for affordable, safe alternatives to purchasing oil from countries that have the power to dictate prices.

"Associated with greenhouse gas emissions, but more strategically with foreign oil, is getting our transportation sector much more efficient. That means engine technologies that get deployed in the next 10-15 years, which are 50 percent more efficient, and that's a unique place for Sandia through the Combustion Research Facility," says Rick Stulen (8000), vice president of Sandia's ECIS SMU. "We have a tremendous history with car and engine companies that positions us to do something extraordinary."

The CRF has worked with the US auto industry to accelerate the development of more efficient engines while reducing emissions. "There isn't a car on the road today that hasn't benefitted from the research and applied programs at the CRF in improving energy efficiency, which means reducing consumption," Rick says.

In addition, Sandia's Battery Abuse Testing Laboratory has been a key player in the US Advanced Battery Consortium, which is under the DOE's FreedomCAR program, for the past decade. Sandia's battery research has helped ensure the safety and reliability of batteries that are powering electric and hybrid vehicles.

"If you look back where we were in terms of the electric vehicle market and market share 10 years ago, it was really pretty small," says Chris Orendorff (2546), team lead for the BATLab. "The Toyota Prius was released in the late 1990s. We've seen a lot more of them on the road in the past 10 years, and now, we're at the emergence of the next plug-in hybrid vehicle technology that, without the last decade of work, wouldn't have happened."

Tom Wunsch (2546) joined the BATLab team as manager in 2007. "We've got a well-defined role in the effort to build electric vehicles," Tom says, "and we recognize the importance of that to making electric vehicles and battery operated vehicles a reality."

### Alternative energy

Three key areas of Sandia's energy research tie directly to national security: lowering the nation's carbon footprint; working in the renewable energy sector; and grid security. Sandia has a long history of developing alternative energy sources, and Sandia energy researchers say they've seen an increase in public support over the past 10 years, but for a variety of reasons.

"I don't think there was an immediate change," says Sandia solar power researcher Chuck Andraka (6123) who formed an important partnership with Stirling Energy Systems in the years after 9/11. "However, three things, I believe, have forged greater public, as well as industrial, interest in solar. First, of course, is the dependency on foreign energy sources. Second is the potential of climate change, and finally, the prices of energy. Unlike the '70s, when price was the only concern on consumers' minds, I think this trio of situations is leading to a more sustained interest by the public."

Greater public interest has been noticed throughout the Labs. "I do think there's clearly an understanding in the country today that clean, renewable energy is important," says Doug Blankenship (6916) of the geothermal energy program. "Geothermal resources in our nation are substantial and can provide clean, indigenous baseload power that is complementary to other renewable energy sources, but we've still got our work to do."

Pat Brady (6910), Sean McKenna (6911), and Steve Bauer (6914), are part of Sandia's geosciences team and agree that there has been more to do since 9/11, particularly in underground energy storage, including oil, gas, hydrogen, and air.

Sandia's long history in protecting the nation meant that although there might be more work, changes to the energy research mission after 9/11 were relatively subtle. "Other organizations had to make really sharp turns, but since Sandia is a national security lab, we didn't," says Pat. "The energy challenge is to come up with inexpensive, sustainable energy from inside this country. If that technical problem can be solved, policy makers'options are a great deal more appealing. That's our mission."

# Plan, prepare

## Labs' security and emergency management practices reflect lessons of 9/11

***By Jennifer Jennings Carr***

In the wake of the terrorist attacks of Sept. 11, 2001, Sandia brought its diverse capabilities to bear on a host of critical threats. The attacks, while bringing into sharp focus the urgency of the Labs' national security mission, also called attention to issues related to Sandia's internal response to security and emergency incidents.

As Sandia emergency management personnel dealt with the unprecedented event, they were often laboring in uncharted territory, dealing with situations for which no contingencies existed in fully developed form. After the immediate 24/7 flurry of activity following 9/11 settled down, emergency management leaders analyzed the response, identifying three distinct areas where processes and procedures needed to be formalized: preparedness and planning, emergency response and security capabilities, and communication and interoperability.

### Preparedness and planning

Preparedness and planning issues became apparent to the 9/11 response team immediately after the attacks. On the morning of 9/11, the Emergency Operations Center (EOC) instructed employees to evacuate the site at the direction of DOE headquarters, but this wasn't as straightforward as it might sound. As people tried to leave the Labs in phases, traffic backed up at the gates. The closure of the Eubank Gate, in particular, contributed to the congestion. Returning to work, even using a staggered call-back proved equally challenging due to time-consuming gate inspections.

The snarled traffic was a nuisance as well as a safety and security concern for Sandians, but it was particularly troublesome because it made base access and egress difficult for mission-critical personnel. Based on this experience, the mission critical badge was created as a direct result of 9/11. The badge allows specific people, identified by their center directors, to access Kirtland Air Force Base under heightened security conditions, if necessary via the Sandia Contractor Gate.

The 9/11 attacks also red-flagged threat-level terminology — the way various branches of government define threat readiness — as a potential problem. At the time of the attacks, there was a significant lack of alignment and understanding among DOE's Security Condition (SECON), DoD's Force Protection Condition (FPCON) and the defense readiness condition (DEFCON) used by the US Armed Forces. DOE's SECON order, new at the time of 9/11, used a graded approach for application. This caused some confusion, as individual buildings at Sandia could be designated at unique SECON levels. The Labs now operates in a "business-as-usual" mode in a uniform SECON status.

Emergency planners found out in the wake of 9/11 that there wasn't a really good way to locate and communicate with Sandians on travel. That was especially true in the immediate hours after the attack when communications were sketchy. To enhance the ability to contact travelers, Emergency Management and International Operations developed procedures to better serve the safety of travelers. These organizations now use a 45-day travel report that designates who is traveling and whom to contact in an emergency. They also monitor and post up-to-the-minute alerts for potential terrorist incidents or natural disasters. In the event of a crisis, Sandia travelers now can be contacted via email with Sandia-issued or personal BlackBerrys or other devices and asked to respond to ascertain their safety. This approach has proven effective in several natural disasters in the decade since 9/11.

### Emergency response and security capabilities

The 9/11 attacks highlighted the need for enhanced capability in emergency response functions and security capabilities. The post-9/11 Emergency Management organization looks very different than it did on the morning of Sept. 11, 2001, becoming more robust through both added equipment and enhanced staffing. With a $1 million equipment budget enhancement in FY2002, Emergency Management was able to purchase better response vehicles and equipment to dramatically improve response functions and communication systems. Also, subsequent resources have now made it possible to staff the 911 call center 24/7, 365 days a year.

The Sandia emergency response and medical organizations also vastly improved integration with KAFB Fire Department capabilities. Emergency Management also split into two separate organizations, one for response and one for planning and support functions. Each grew with their respective in-house capabilities: response grew to encompass hazardous materials, emergency medical services, heavy rescue and confined space rescue, aside from their normal response ability; and planning grew for better in-house capabilities for analysis of hazards and drill and exercise development. Prior to 9/11, the EOC was not able to effectively handle classified security issues — a notable shortcoming brought to light because of the 9/11attacks — but Sandia resolved this issue.

### Communication and interoperability

The events of 9/11 prompted development of increased interoperability and communication capabilities both within Sandia and between Sandia and other agencies. Prior to 9/11, there was no alert system available, either by portions of the Labs or in its entirety. The Tone Alert Radios (TARs) were added to allow an alert capability throughout the Labs, a critically important consideration when employees are required to take protective action. TAR drills are continually conducted to ensure the system works. The Sandia 1640 AM radio station, which had been in limbo for several years, was revitalized in the wake of 9/11 to augment other communication capabilities. It is primarily used to communicate with people in vehicles, at or near Sandia.

Better interoperability also includes Sandia's ongoing relationship with the KAFB Threat Assessment Group and the Office of Special Investigations. The enhanced relationship lends to more efficient processes if an incident occurs. A large change post-9/11 is the inclusion of intelligence into response efforts. The National Incident Management System, a system for emergency response, changed to add intelligence to all levels of command. The sharing of intelligence was under scrutiny after 9/11, and now the FBI is in charge of homeland incidents, where as the CIA controls international incidents. Also "intel" fusion centers are gaining in popularity as did the Counterintelligence office. Fusion centers are now often associated with emergency operations to enhance response capabilities.

Other areas of interoperability include increased coordination among different areas of the Labs. Gate provisions changed after 9/11. Now high-profile vehicles can only go through the West Gate or the Contractor Gate and are subject to ongoing inspections. Just after 9/11, Sandia security police officers staffed all gates with Kirtland security police for added enforcement. Also, coordination with other sites has improved, mostly for foreign and domestic travelers.

In summary, this is a small sample of methodologies that Sandia addressed and enhanced following 9/11. Sandia continually works to enhance security and emergency response capabilities to ensure the safety of the workforce.

# Strong and resilient

## Does the Star Spangled Banner yet wave?

***By Iris Aboytes***

It was about 2 o'clock in the afternoon. Through my window I saw no cars on the street, no people walking through the parking lot. It was still and quiet except for the news on the radio and the vivid pictures on television. It was Sept. 11, a day when the heart of America was severely ripped.

The crisp morning air brought shock to most Americans. The most powerful nation on Earth experienced vulnerability in its homeland.

Sandia dismissed all nonessential personnel about mid-morning. I work with the internal and external communicators, so our personnel all stayed behind. Once I knew my family was safe, I began to try to deal with the shock and fear that we were all experiencing.

Four planes crashed that morning. The first could have been an accident, but when multiple planes crashed, even the most trusting of us knew it was intentional. Each plane was intent on causing harm to our people.

Questions and more questions flooded my mind as I tried to understand, first, what was happening, then, what has happened?

In my comatose-like state-of-mind, afraid to breathe, I tried to grasp the reality of it all. Was I sure this was not a nightmare? Was I going to wake up any minute and everything and everyone would be all right? Even Steven Spielberg could not have conceived such a nightmare. But it wasn't a nightmare, and I did not wake up. This was today's reality.

Most of us are not world travelers. I certainly was not familiar with the twin towers. I had never been in or seen a building 110 stories high. It was more than I could hope to comprehend. Thinking about it only made me feel anxious.

I became a TV watcher that day. The last time I had experienced that kind of obsession was when as a kid I watched the TV coverage about President Kennedy's assassination.

The visual impact — the planes hitting, the fires, the people jumping, the firefighters with their hoses, the people running in the streets, dust and debris everywhere — then as if more was needed — the buildings imploded. It was as if they got tired of holding on and just gave up.

Eyes closed. Eyes opened. The images remained the same.

I could visualize the third plane hitting the Pentagon. I had worked in D.C. To me, the five-sided building, is a symbol of our country's defenses against all enemies, its armor impenetrable. Yet on this day a plane came to rest on its mighty walls. How could this have happened?

The last plane, in my opinion was, full of heroes. Each passenger had the presence of mind to save the lives of Americans and together they became a legion of freedom fighters. Knowing what was happening, instead of just sitting back, they became a powerful weapon. To them, go heroic honors from a grateful nation.

A FIREFIGHTER takes a break from the massive recovery effort at Ground Zero in the aftermath of the Sept. 11, 2001, terrorist attacks. (Photo by Michael Rieger, courtesy of FEMA)

American heroes were not in short supply that day or for days thereafter. The fires still burned. The piles of steel were still visible. There in the middle of the destruction a flag waved over its mournful nation. Its colors were still bright and, if possible, its resolve even stronger.

I was happy to find my family well that evening. Their hugs were especially tight. Grateful as I was that we were all safe, I almost felt guilty because I knew there were thousands of families whose lives would never be the same.

For me, as for many other Americans, our national anthem became my prayer. Radio stations played it continuously. No longer were they just memorized words all grouped together. Those words had come to life, their meaning clear and reassuring. In the midst of all the craziness, those words brought me peace.

America is strong and its people resilient. Oh say, does that Star Spangled Banner yet wave, o'er the land of the free and the home of the brave?

YES IT DOES!

Photo by James Tourtellotte, U.S. Customs and Border Protection, courtesy of Wikimedia.

# Shock and disbelief

## The day we rediscovered our national pride

At the time of the attack, like everyone else, I was in shock and disbelief. Until that day it was unfathomable to suffer an attack of that magnitude on our own soil. (Especially for those of us who don't remember Pearl Harbor first-hand, or at least since then, we have developed a false sense of security.) We all grieved for those who lost their lives and for their families, but what I remember most is the brief solidarity the attacks brought to the whole country and even the world.

For a short time afterward, we actually put aside our own individual troubles and discontent. We rediscovered our national pride. We were willing to focus on a unified goal to recover from the attacks. The slogans "United we Stand" and "We will never forget" were seen on TV, posted outside houses, and placarded on cars — along with the American flag.

I thought it was amazing that the slogans and the common outpouring of solidarity actually translated into a greater level of civility and cooperation. I noticed while driving in jammed rush-hour traffic in the following days, people weren't aggressively trying to cut everyone else off. They were more willing to let others move in front them, which allowed traffic to move much more smoothly than was the case prior to the attacks.

At work, individuals were more willing to cooperate and comprise during decision-making and performing tasks. We realized at that moment in time that our smaller problems and difficulties were insignificant in the grand scheme of things. As Sandians, we have worked tirelessly since then to help contribute to the protection of the country and our soldiers and we are proud of that fact.

I personally do not have a problem with the resulting restrictions and reductions of freedoms we've had to absorb to attempt to make the country safer from additional attacks. (Although those restrictions are very inconvenient and I wonder how effective they are in preventing future attacks.) I keep a reminder of what we endured by continuing to wear on my badge an American flag pin we were given after the attack.

*"We actually put aside our own individual troubles and discontent. We rediscovered our national pride."*

**— Mark Olona**

I feel that I have "not forgotten" and I will continue to "stand united" to try to preserve what this country stands for. I worry that, generally speaking, this country has lost sight of how tragic, but important the September 11th attacks were for the continued development and future of our nation. — *Mark Olona*